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NEC Express5800/120Ri-2
User's Guide

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Keep this User's Guide at hand for quick reference at anytime necessary.

SAFETY INDICATIONS

Follow the instructions in this User's Guide for your safety to use the server.

The server contains components with possible danger, hazards that may cause by ignoring warnings, and preventive actions against such hazards.

Server components with possible danger are indicated with a warning label placed on or around them as well as described in this User's Guide.

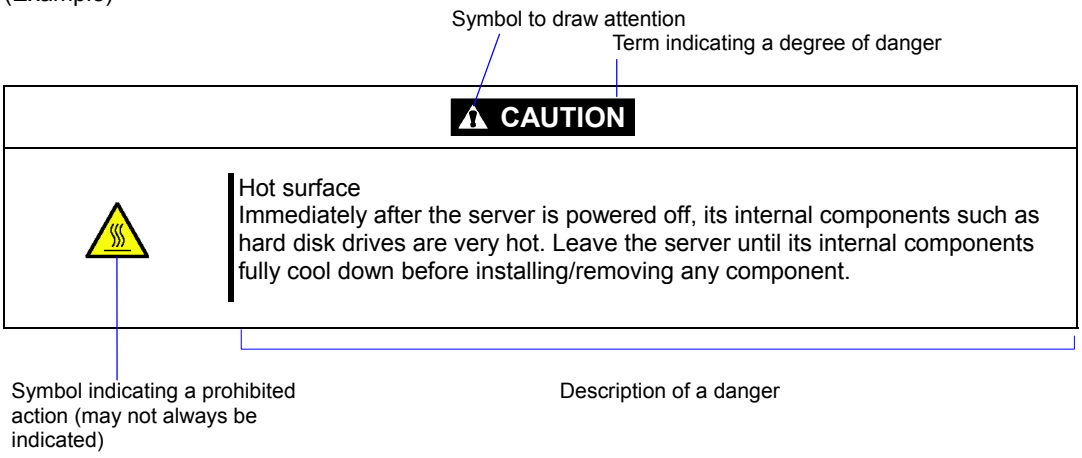
In the User's Guide or warning labels, "WARNING" or "CAUTION" is used to indicate a degree of danger. These terms are defined as follows:

⚠ WARNING	Indicates the presence of a hazard that may result in death or serious personal injury if the instruction is ignored.
⚠ CAUTION	Indicates the presence of a hazard that may cause minor personal injury, including burns, or property damage if the instruction is ignored.

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type. (Attention)
	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action. (Prohibited Action)
	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard. (Mandatory Action)

(Example)


Symbol to draw attention
Term indicating a degree of danger
CAUTION
Hot surface
Immediately after the server is powered off, its internal components such as hard disk drives are very hot. Leave the server until its internal components fully cool down before installing/removing any component.
Symbol indicating a prohibited action (may not always be indicated)
Description of a danger

SYMBOLS USED IN THIS USER'S GUIDE AND WARNING LABELS

Attentions

	Indicates that improper use may cause an electric shock.
	Indicates that improper use may cause personal injury.
	Indicates that improper use may cause explosion or burst.
	Indicates that improper use may cause fingers to be caught.
	Indicates that improper use may cause personal injury.
	Indicates that improper use may cause fumes or fire.
	Indicates a general notice or warning that cannot be specifically identified.

Prohibited Actions

	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.
	Keep water or liquid away from the server. Otherwise, an electric shock or a fire may be caused.
	Do not touch the server components with wet hand. Otherwise, an electric shock may be caused.
	Do not place the server near a fire. Otherwise, a fire may be caused.
	Do not touch any other component than specified. Otherwise, an electric shock or burn may be caused.
	Indicates a general prohibited action that cannot be specifically identified.

Mandatory Action

	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.
	Be sure to provide earthing. Otherwise, an electric shock or fire may be caused.
	Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Statement

Warning: This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

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Windows Server 2003 x64 Editions stands for Microsoft® Windows Server® 2003 R2, Standard x64 Edition Operating system and Microsoft® Windows Server® 2003 R2, Enterprise x64 Edition operating system, or Microsoft® Windows Server® 2003, Standard x64 Edition operating system and Microsoft® Windows Server® 2003, Enterprise x64 Edition operating system. Windows Server 2003 stands for Microsoft® Windows Server® 2003 R2, Standard Edition operating system and Microsoft® Windows Server® 2003 R2, Enterprise Edition operating system, or Microsoft® Windows Server® 2003, Standard Edition operating system and Microsoft® Windows Server® 2003, Enterprise Edition operating system.
Windows XP x64 Edition stands for Microsoft® Windows® XP Professional x64 Edition operating system. Windows XP stands for Microsoft® Windows® XP Home Edition operating system and Microsoft® Windows® XP Professional operating system. Windows 2000 stands for Microsoft® Windows® 2000 Server operating system and Microsoft® Windows® 2000 Advanced Server operating system, and Microsoft® Windows® 2000 Professional operating system. Windows NT stands for Microsoft® Windows NT® Server network operating system version 3.51/4.0 and Microsoft® Windows NT® Workstation operating system version 3.51/4.0. Windows Me stands for Microsoft® Windows® Millennium Edition operating system. Windows 98 stands for Microsoft® Windows®98 operating system. Windows 95 stands for Microsoft® Windows®95 operating system.

Momentary voltage drop prevention:

This product may be affected by a momentary voltage drop caused by lightning. To prevent a momentary voltage drop, an AC uninterruptible power supply (UPS) unit should be used.

PREFACE

Welcome to the NEC Express5800/120Ri-2 server.

The NEC Express5800 server holds powerful performance and employs the latest technology to implement a computer for the next generation. With its potential capabilities, the server may be used as the workstation PC that configures a client-server system and provides high-speed processing and superior reliability.

Read this User's Guide thoroughly to fully understand handling of the server and appreciate its functions to the maximum extent.

ABOUT THIS USER'S GUIDE

This User's Guide is a guide for proper setup and use of the server.
This User's Guide also covers useful procedures for dealing with difficulties and problems that may arise during setup or operation of the server.
Keep this manual for future use.
The following describes how to proceed with this User's Guide.

How to Use This User's Guide

To aid you in finding information quickly, this User's Guide contains the following information:

Chapter 1 Notes on Using Your Server
includes information that needs attention to use the server. Make sure to read this chapter before setting up and using the server. It also includes requirements and advisory information for transfer and disposal of the server.

Chapter 2 General Description
includes information necessary to use the server, such as names and functions of its components, handling of the DVD-ROM drive.

Chapter 3 Setting Up Your Server
tells you how to select a site, unpack the system, assemble the rack-mount subsystem, make cable connections, and power on your system.

Chapter 4 Configuring Your Server
tells you how to configure the system and provides instructions for running the BIOS SETUP Utility and the RAID configuration utility, which is used to configure RAID drives in your system. This chapter also provides information on mother board jumper settings.

Chapter 5 Installing the Operating System with Express Setup
describes how to install the operating system.

Chapter 6 Installing and Using Utilities
describes how to install the utilities for the server. It also includes a description on using the attached "NEC EXPRESSBUILDER" CD-ROM.

Chapter 7 Maintenance
provides you with all the information necessary to maintain successful operation of the server. This chapter also includes a description on relocating and storing the server.

Chapter 8 Troubleshooting
contains helpful information for solving problems that might occur with your system.

Chapter 9 Upgrading Your Server
provides you with instructions for upgrading your system with an additional processor, optional memory, optional add-in cards, hard disk drives, peripheral devices, and power supply.

Appendix A Specification
provides specifications for your server.

Appendix B Other Precautions
provides supplementary notes on using the server.

Appendix C IRQ and I/O Port Address
provides a list of factory-set IRQs and I/O port addresses assigned.

Appendix D Installing Windows Server 2003 x64 Editions
describes how to install Microsoft Windows Server 2003 x64 Editions without using Express Setup. Using the Express Setup tool is recommended for installing Windows Server 2003 x64 Editions. See Chapter 5 for details.

Appendix E Installing Windows Server 2003
describes how to install Microsoft Windows Server 2003 without using Express Setup. Using the Express Setup tool is recommended for installing Windows Server 2003. See Chapter 5 for details.

Appendix F Product Configuration Record Table
provides a table to be filled with your server configuration.

Text Conventions

The following conventions are used throughout this User's Guide. For safety symbols, see "SAFETY INDICATIONS" provided earlier.

IMPORTANT:	Items that are mandatory or require attention when using the server
NOTE:	Helpful and convenient piece of information

IN THE PACKAGE

The carton contains various accessories, as well as the server itself. See the packing list or "Getting Started" guide to make sure that you have everything and that individual components are not damaged. If you find any component missing or damaged, contact your sales agent.

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Chapter 1

Notes on Using Your Server

This chapter includes information necessary for proper and safe operation of the server.

WARNING LABELS

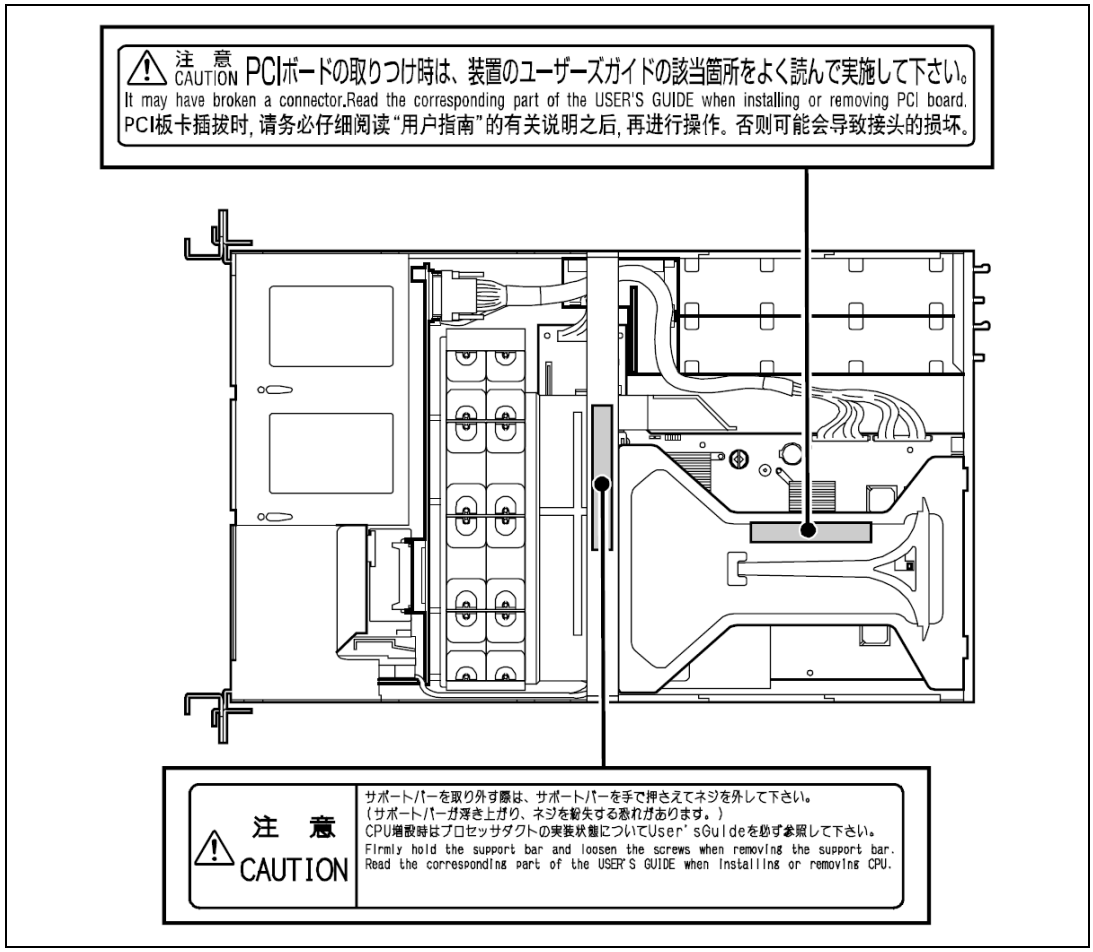
The warning label is attached to components with possible danger or their vicinity in your server to inform the user that a hazardous situation may arise when operating the server. (Do not intentionally remove or damage any of the labels.)

If you find any labels totally/partially removed or illegible due to damage, contact your service representative.

External View

⚠ 注 意 CAUTION
・高温になるコンポーネントがあります。十分に冷えてから触れるようにしてください。
・電源を切ってもバッテリで稼動している部分があります。保守をするまえに各々のコンポーネントの取り扱い説明書をお読みください。
・As some components may become very hot during system operation,give ample time to allow cooling as well as use precaution when handling internal components immediately after powering down. ・Some internal components may still be operational on battery power. Refer to instruction manuals for this system as well as options prior to maintenance.
・有的部件可能会达到高温。请注意待其冷却之后再接触。
・有的部件即使切断电源仍然使用电池在运转。进行设备维护前，请事先阅读各部件相关的说明书。
⚠ 注 意 CAUTION
オプションの取付け、取外し時は電源プラグをコンセントから抜き、外部装置と接続しているケーブルを外して下さい。
Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.
进行可选配件的安装和拆卸时，请先把电源插头从插座中拔出，并取下与外部设备连接着的线缆。
ネジは本体内部へ落とさない様、十分ご注意下さい。
Do not drop any screws inside the system.
请一定注意不要把螺丝掉落在主机内部。
ボード及びオプション機器の接続の際は、必ずユーザーズガイドを参照し、正しく接続して下さい。誤った接続は、故障や火災の原因となります。
Refer to the "User's Guide" when option board or peripherals are installed. Incorrect installations may result in damage to the system and lead to accidents.
对板卡以及可选设备进行连接时，请务必参照"用户指南"，正确进行连接。如果错误连接，可能会导致故障或火灾的发生。
指をはさんだり、ぶつけたりしないように注意して下さい。
To avoid the risk of personal injury, be careful when accessing the inside of the system.
请小心不要夹住或碰伤手指。
装置の持ち上げ、移動の際は、装置の底面をしっかり持って持ち上げて下さい。
Firmly hold the bottom of the system when required to lift and carry the system.
抬起或移动设备时，请注意托稳设备底部。
243-201192-001-A-1
重量物注意
WARNING: HEAVY ITEM
注意重物
ぎっくり腰や落下事故防止のため移動のさいは2人以上で行って下さい。
To avoid the risk of personal injury or damage to the unit, move the unit with at least two or more people.
为了防止腰肌受损以及物体失手落下，移动设备时请一定由２个人以上进行。
243-201192-001-A-1

Internal View


注 意
CAUTION PCIボードの取りつけ時は、装置のユーザーズガイドの該当箇所をよく読んで実施して下さい。
It may have broken a connector.Read the corresponding part of the USER'S GUIDE when installing or removing PCI board.
PCI板卡插拔时,请务必仔细阅读"用户指南"的有关说明之后,再进行操作。否则可能会导致接头的损坏。
注 意
CAUTION
サポートバーを取り外す際は、サポートバーを手で押さえてネジを外して下さい。
(サポートバーが浮き上がり、ネジを紛失する恐れがあります。)
CPU増設時はプロセッサダクトの実装状態についてUser's Guideを必ず参照して下さい。
Firmly hold the support bar and loosen the screws when removing the support bar.
Read the corresponding part of the USER'S GUIDE when installing or removing CPU.

SAFETY NOTES

This section provides notes on using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, see "SAFETY INDICATIONS" provided earlier.

General

WARNING

Do not use the server for services where critical high availability may directly affect human lives.

Your server is not intended to be used with or control facilities or devices concerning human lives, including medical devices, nuclear facilities and devices, aeronautics and space devices, transportation facilities and devices; and facilities and devices requiring high reliability. NEC assumes no liability for any accident resulting in personal injury, death, or property damage if the server has been used in the above conditions.

Do not use the server if any smoke, odor, or noise is present.

If smoke, odor, or noise is present, immediately turn off the server and disconnect the power plug from the outlet, then contact your service representative. Using the server in such conditions may cause a fire.

Keep needles or metal objects away from the server.

Do not insert needles or metal objects into ventilation holes in the server or openings in the DVD-ROM drive. Doing so may cause an electric shock.

Do not use the server in any unapproved place.

Install the server on a standard EIA 19-inch rack assembly. Do not install the rack containing the server in a place inappropriate to the rack installation environment.
Failure to follow these instructions may cause some bad influences to be imposed on the server and other systems installed on the rack and also a fire or personal injury due to falling of the rack may occur. For the detailed explanation on the place where the server should be installed and the earthquake-resistant construction for the rack, refer to the manual attached to the rack or contact you service representative.

Always install the server on a rack conforming to the relevant standard.

Install the server on a rack confirming to the EIA standard for the Server to be used. Do not use the server with installed on any other rack than standard EIA 19-inch rack or without the installation on a proper rack. Failure to follow these instructions may cause the server to operate incorrectly and/or personal injury or damages of surrounding devices to occur. Contact your service representative for the racks available for the server.

⚠ CAUTION

Keep water or foreign matter away from the server.

Do not let any form of liquid (water etc.) or foreign matter (e.g., pins or paper clips) enter the server. Failure to follow this warning may cause an electric shock, a fire, or a failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server. Contact your service representative.

Power Supply and Power Cord Use

⚠ WARNING

Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.

Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

⚠ CAUTION

Plug in to a proper power source.

Use a proper wall outlet. Use of an improper power source may cause a fire or a power leak.
Do not install the server where you need an extension cord. Use of a cord that does not meet the power specifications of the server may heat up the cord and cause a fire.

Do not connect the power cord to an outlet that has an illegal number of connections.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.

Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

Use the authorized power cord only.

Use only the power cord that comes with your server. Use of an unauthorized power cord may cause a fire when the electric current exceeds the rated flow. Also, observe the following to prevent an electric shock or fire caused by a damaged cord.

- Do not stretch the cord harness.
- Do not pinch the power cord.
- Do not bend the power cord.
- Keep chemicals away from the power cord.
- Do not twist the power cord.
- Do not place any object on the power cord.
- Do not bundle power cords.
- Do not alter, modify, or repair the power cord.
- Do not secure the power cord with staples or equivalents.
- Do not use any damaged power cord. (Replace a damaged power cord with a new one of the same specifications. Ask your service representative for replacement.)

Do not use the attached power cord for any other devices or usage.

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

Rack

⚠ CAUTION

Do not carry or install the server only by a single person.

More than one person is required to carry or install the rack. Failure to follow this instruction may cause the rack to fall to result in personal injury and/or breakages of surrounding devices. In particular, a high rack (such as 44U rack) is unstable if it is not fixed by stabilizers. More than one person must always carry or install the rack while they support it.

Do not install the server so that the load may be concentrated on a specific point.

Install stabilizers on the rack so that the total load of the rack and devices mounted on the rack is not concentrated on a singe point or join more than one rack with each other to distribute the load. Failure to follow this instruction may cause the rack to fall to result in personal injury.

Do not install components on the server only by a single person.

More than one person is required to install parts including the doors and trays for the rack. Failure to follow this instruction may cause some parts to fall to be broken and/or to result in personal injury.

Anchor the equipment rack.

The equipment rack must be anchored to an unmovable support to prevent it from falling over when one or more servers are extended in front of it on slide assemblies. The anchors must be able to withstand a force of up to 113 kg (250 lbs.) You must also consider the weight of any other device installed in the rack.

Do not leave more than one device being pulled out from the rack.

Pulling out more than one device from the rack may cause the rack to be fallen. Only pull out a single device from the rack at a time.

Do not provide the wiring for the server to exceed the rating of the power supply.

To prevent burns, fires, and device damages, the power supplied to the power supply in the rack shall not exceed the rating load of the power branch circuit. Contact your electric constructor or the local power company for the requirements on the wiring and installation of electric facilities.

Installation, Relocation, Storage, and Connection

⚠ WARNING

Disconnect the power cord(s) before installing or removing the server.

Make sure to power off the server and disconnect the power cord(s) from a power outlet before installing/removing the server. All voltage is removed only when the power cords are unplugged.

⚠ CAUTION

Never attempt to lift the server only by yourself.

The server weighs max. 31 kg (depending on its hardware configuration). Carrying the server only by yourself may strain your back. Hold the server firmly by its bottom with another person to carry it. Do not hold the front door to lift the server. The front door may be disengaged from the server, causing personal injury.

Do not install the server in any place other than specified.

Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.

- a dusty place
- a humid place such as near a boiler
- a place exposed to direct sunlight
- an unstable place

Do not install the server on a rack with leaving covers removed.

Do not install the server on a rack with the cover being removed. Failure to follow this instruction may reduce the cooling effect in the server to result in some malfunction and/or dusts to enter the server to result in a fire or electric shock.

Do not pinch your finger with rails or other components.

Note sufficiently that your fingers may not be caught between a rail and another mechanical part or cut by a rail at installation or removal of the server from the rack.

Do not apply any load on the server pulled out from the rack.

Do not apply any load on the server pulled out from the rack. Doing so bends the frame of the server. Consequently, the server cannot be pushed back into the rack. Placing an object on the server may also cause personal injury if the server drops.

⚠ CAUTION

Do not connect any interface cable with the power cord of the server plugged to a power source.

Make sure to power off the server and unplug the power cord from a power outlet before installing/removing any optional internal device or connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire resulted from a short circuit.

Do not use any unauthorized interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire. Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the server with loose cable connections.

Cleaning and Working with Internal Devices

⚠ WARNING

Do not disassemble, repair, or alter the server.

Never attempt to disassemble, repair, or alter the server on any occasion other than described in this User's Guide. Failure to follow this instruction may cause an electric shock or fire as well as malfunctions of the server.

Do not remove the lithium battery.

The server contains the lithium battery. Do not remove the battery. Placing the lithium close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead lithium battery, contact your service representative. Do not disassemble the server to replace or recharge the battery by yourself.

Disconnect the power plug before cleaning the server.

Make sure to power off the server and disconnect the power plug from a power outlet before cleaning or installing/removing internal optional devices. Touching any internal device of the server with its power cord connected to a power source may cause an electric shock even of the server is off-powered.

Disconnect the power plug from the outlet occasionally and clean the plug with a dry cloth. Heat will be generated if condensation is formed on a dusty plug, which may cause a fire.

⚠ CAUTION

Avoid installation in extreme temperature conditions.

Immediately after the server is powered off, its internal components such as hard disk drives are very hot. Leave the server until its internal components fully cool down before installing/removing any component.

Make sure to complete board installation.

Always install a board firmly. An incompletely installed board may cause a contact failure, resulting in smoking or fire.

Do not touch any electrical components inside the server during the hot-swap replacement.

All power flows inside the server while the hot-swap replaceable components (hard disk, cooling fan and power supply). Do not touch the electrical components inside the server to avoid an electric shock.

During Operation

⚠ CAUTION

Do not pull out or remove the server from the rack unnecessarily.

Do not pull out or remove the server from the rack unnecessarily. Pulling out or removing the server from the rack may cause not only the server to operate incorrectly but also the server to fall on people to make them injured.

Stay away from the fan.

Keep your hand or hair away from the cooling fan on the rear of the server. Failure to follow this warning may get your hand or hair caught in the fan, resulting in injury.

Avoid contact with the server during thunderstorms.

Disconnect the power plug from the outlet when a thunderstorm is approaching. If it starts thundering before you disconnect the power plug, do not touch any part of the server including the cables. Failure to follow this warning may cause a fire or an electric shock.

Keep animals away from the server.

Failure to follow this warning may cause a fire or an electric shock.

Do not place any object on top of the server.

The server may fall and cause property damage to the surroundings.

Do not leave the server with its DVD-ROM tray ejected.

Dust may enter the server through openings and cause malfunctions of the server. Any person may also bump it and get injured.

Do not use a cellular phone or pager around the server.

Turn off the cellular phone or pager. Radio interference may cause malfunctions of the server.

FOR PROPER OPERATION

Observe the following notes for successful operation of the server. Use of the server ignoring the notes will cause malfunctions or failures of the server.

- Install the rack assembly in a place that meets requirements for successful operation. For details, see Chapter 3, "Setting Up Your Server."
- The server is intended for installation in a Restricted Access Location, mounted above a non-combustible material.
- Do not delete the maintenance partition created be NEC EXPRESSBUILDER although it may appear on the OS.
- Make sure to power off the server before connecting or disconnecting cables between the server and peripheral devices.
- Verify that the access LED on the server is unlit before turning off the server or ejecting the floppy disk.
- The server management logic on your system board monitors and logs system voltage changes. When plugging the power cord to the system, you may experience 30 seconds delay from the time you press the POWER switch on the front panel. This is normal system operation and is required by the server management logic.
- Do not turn off the server until the POST (Power On Self-Test) completes. See Chapter 2 for details of POST.
- When you have just turned off the server, wait at least 30 seconds before turning it back on.
- When unplug the power cord(s) from the server, wait at least 30 seconds before re-pluging the power cord(s) to the server.
- Turn off the power and unplug the power cord from the outlet before relocating the server.
- Clean the server on a regular basis. (See Chapter 7 for cleaning.) Regular cleaning proactively prevents various failures of the server.
- Lightning may cause a momentary voltage drop. To prevent this problem, it is recommended to use of an uninterruptible power supply unit.
- Check and adjust the system clock before the operation if any of the following conditions is applicable.
  - After carriage of device
  - After storage of device
  - After the device is entered into the pause state under the environmental condition enduring device operation (temperature: 10°C - 35°C, humidity: 20% - 80%)
- Check the system clock at the rough rate of once per month. When the system clock is installed in a system requiring high time precision, it is recommended to use a time server (NTP server).
  If the system clock is remarkably delayed or advanced as the passage of time in spite of adjustment, contact your service representative to ask maintenance.

- Store the unit under the storage condition (temperature: –10°C - 55°C, humidity: 20% - 80%, without condensation) to allow built-in devices and the unit to operate correctly in the next operation.
- Make sure to use optional devices supported by the server. Some non-supported devices may be physically installed/connected but cause failures of the server as well as a malfunction of the server.
- NEC recommends you use NEC's genuine products. Some third-party products claim that they support the server. However, repair of the server due to a failure or damage resulted from use of such third-party products will be charged.

TRANSFER TO THIRD PARTY

The following must be observed when you transfer (or sell) the server or software provided with the server to a third party:

Server Hardware

Make sure to provide this User's Guide along with the server to a third party.

Provided Software

To transfer or sell any software application that comes with the server to a third party, the following requirements must be satisfied:

- All provided software applications must be transferred and no backup copies must be retained.
- Transfer requirements listed in "Software License Agreement" that comes with each software application must be satisfied.
- Software applications that are not approved for transfer must be uninstalled before transferring the server.

DISPOSAL AND CONSUMABLES

- Dispose the server, all the internal devices and DVD-ROMs according to all national laws and regulations.

> **IMPORTANT:** For disposal (or replacement) of the battery on the mother board of the server, consult with your service representative.

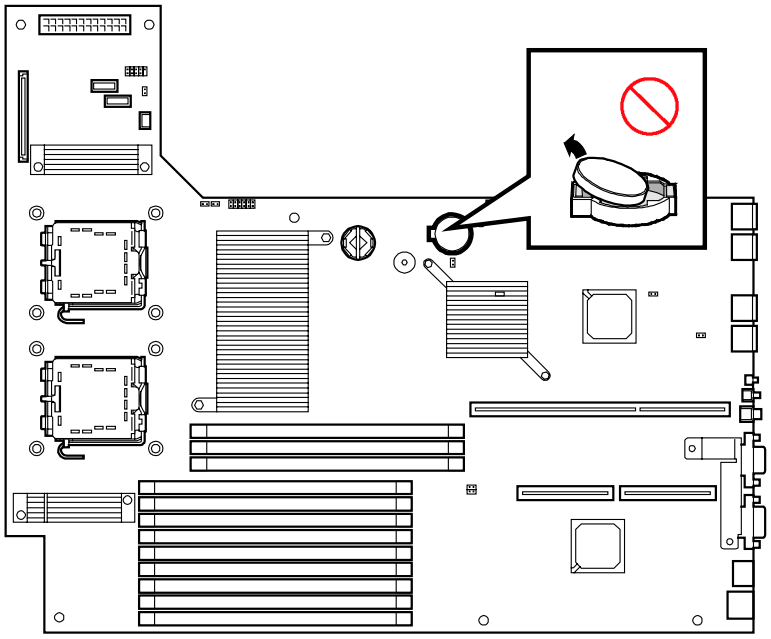
- The server contains some components that are only good for a limited period of time and require replacement, such as fans, internal batteries, the internal DVD-ROM drive, and the mouse. For stable operation of the server, NEC recommends you replace these components on a regular basis. Consult with your service representative for replacement or the product lives.

⚠ WARNING

Do not remove the lithium battery.

The server contains the lithium battery. Do not remove the battery. Placing the lithium or nickel cadmium battery close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead lithium battery, contact your service representative. Do not disassemble the server to replace or recharge the battery by yourself.



Mother board

USER SUPPORT

Before Asking for Repair, do the following when the server appears to fail:

1. Check if the power cord and the cables to other devices are properly connected.
2. See Chapter 8 to find if your problem fits the description. If it does, take the recommended measure for it.
3. Check if the software required for operation of the server is properly installed.

If the server still appears to fail after you have taken the above actions, consult with your service representative immediately. Take notes on LED indications of the server and alarm indications on the display unit before consultation, which may provide a significant help to your sale agent.

Advice for Health

The longer you keep using the computer equipment, the more you become tired, which may cause disorders of your body. When you use a computer, observe the following to keep yourself from getting tired:

Good Working Posture

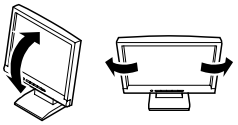
You have good posture if the following are satisfied when you use a computer:

- You sit on a chair with your back straight.
- Your hands are parallel with the floor when you put them on the keyboard.
- You look at the screen slightly lower than your eye height.

You have "good working posture" as described in the above when no part of your body is under excess strain, in other words when your muscles are most relaxed.

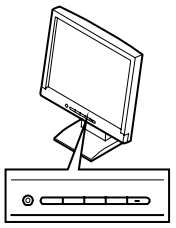
You have "bad posture" when you sit with your back hunched up or you operate a display unit with your face close to the screen. Bad working posture may cause eye strain or poor eyesight.

Adjustment of Display Unit Angles



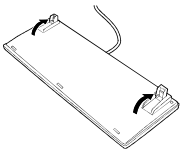
Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. You will not be able to keep "good working posture" and you will feel more tired than you should if you operate a display unit without adjusting horizontal and vertical angles.

Adjustment of Screen Brightness and Contrast

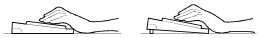


The display unit has brightness and contrast adjustment functions. The most suitable brightness and contrast depend on the individual and the working environment (well-lighted room or insufficient light). Adjust brightness and contrast so that the screen will be easy to see. An extremely bright or dark screen will give a bad effect to your eyes.

Adjustment of Keyboard Angle



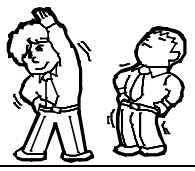
The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.



Cleaning of Equipment

Clean equipment regularly. It is difficult to see the display contents on a dusty screen. Keeping equipment clean is also important for your sight.

Fatigue and Rest



If you feel tired, you should stop working and do light exercises.

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Chapter 2

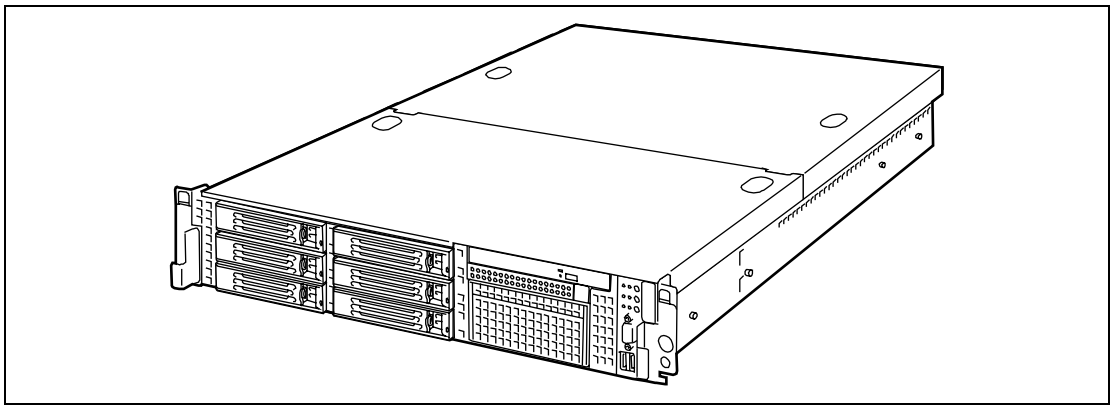
General Description

This chapter provides information that you should be familiar with before using the server. It includes names and functions of the components and features of the server.

OVERVIEW

Your server is a modular, multiprocessing server based on the Intel® Xeon® microprocessor. It is a solid performer and offers the latest technology. The combination of compute performance, memory capacity, and integrated I/O provides a high performance environment for many server market applications. These range from large corporations supporting remote offices to small companies looking to obtain basic connectivity capability such as file and print services, e-mail, web access, web site server, etc.

Your server is housed and available as a rack-mount system. Your server conveniently installs into a standard EIA 19-inch rack assembly.

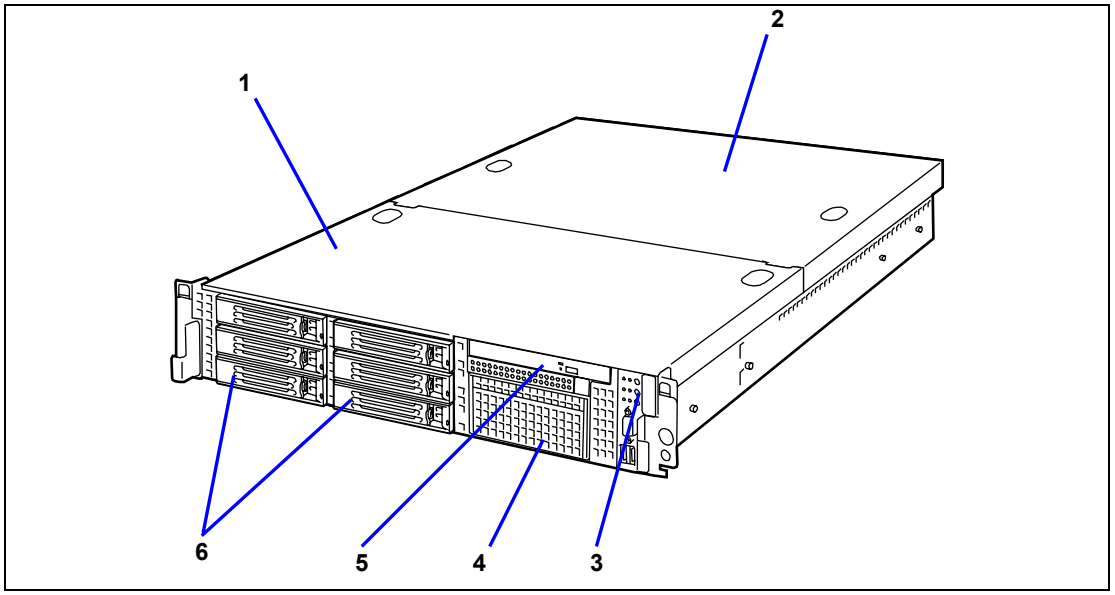


Your server includes a DVD-ROM drive, six hot-swap Serial Attached SCSI (SAS) hard disk drive bays, and a removable media device bay. The hot-swap SAS hard disk drive bays support up to six 1.0-inch SAS hard disk drives that can be swapped in or out of the system without powering it down, if RAID functionality is configured in the system.

The removable media drive bay may be used for installation of a high-speed tape drive.

As application requirements increase, you can expand your server with an additional processor, additional memory, add-in boards, and hard disk drives.

External View



1 **Drive cover**

2 **Logic cover**

3 **Switches, indicators, and front I/Os**

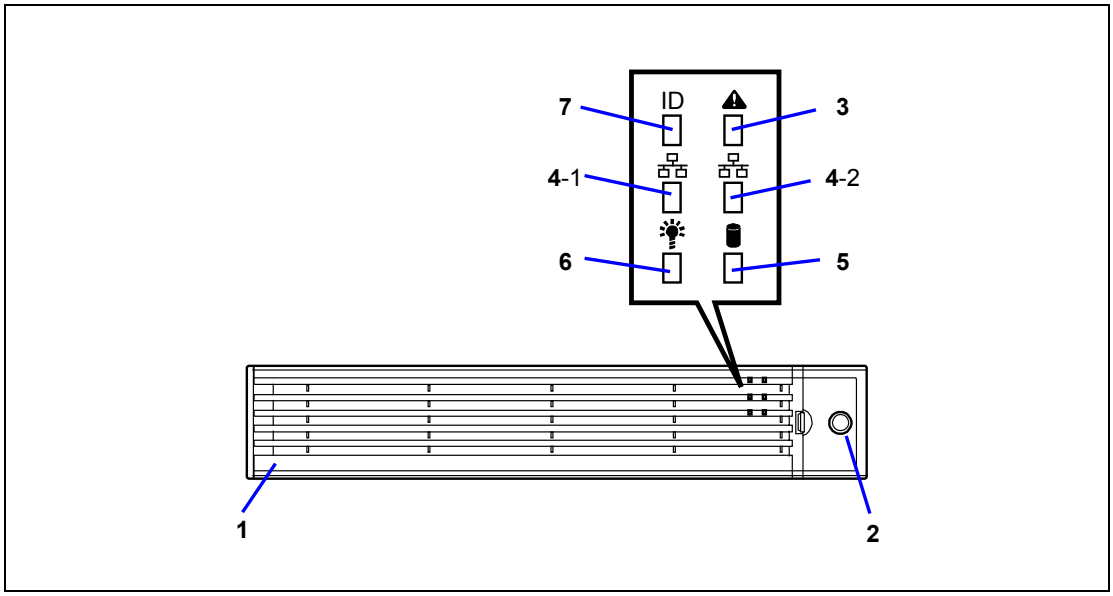
4 **Backup file device bay**

5 **Optical disk drive**

6 **SAS hot-plug hard disk drive bay**

Front View with Front Bezel Attached

The following figure shows the location of the front system features.



1 Front bezel
The front bezel is a cover protecting the front devices during daily operation. A security key is provided to lock the cover.

2 Key slot
Insert the security key into this slot when unlocking the front bezel.

3 STATUS LED (green/amber) (on the front panel)
This LED indicates the server status. The LED is green during normal operation. The LED turns amber or flashes when the server enters the abnormal state.

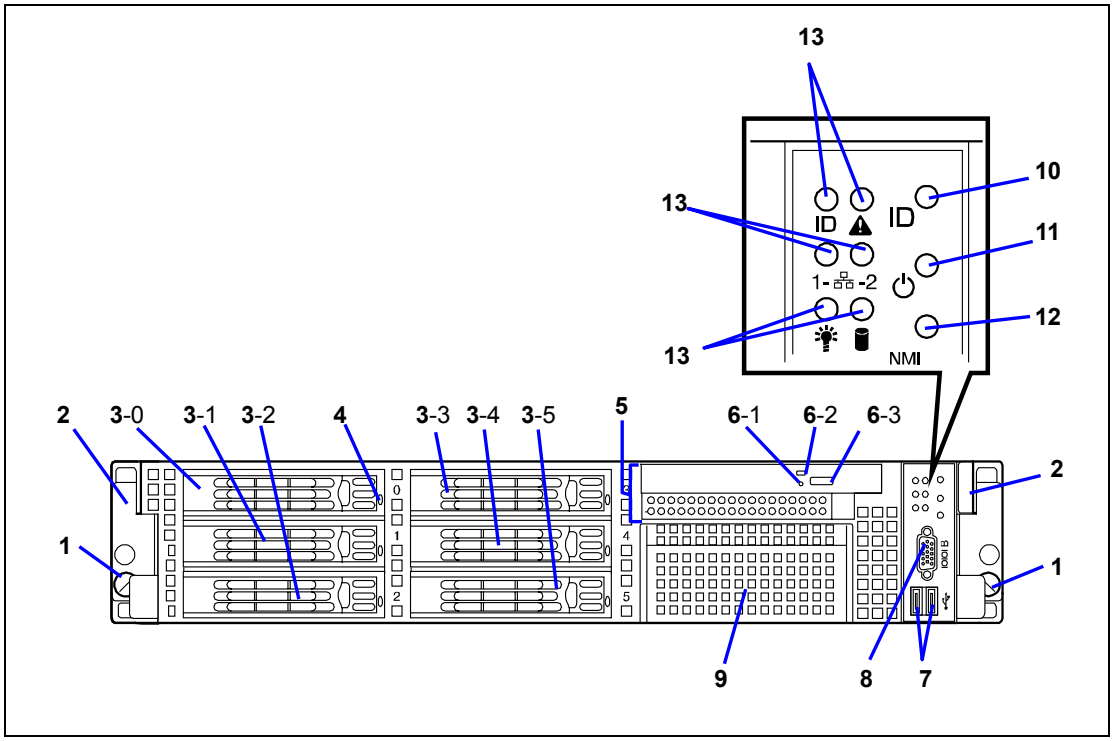
4 ACT LED (green)
This LED is on while the system is connected to the network. The number "1" on the icon indicates LAN port 1, and the number "2" indicates LAN port 2.

5 DISK ACCESS LED (green/amber)
This LED is green during access to the internal hard disk drives. The LED turns amber when even one of the internal hard disk drives fails.

6 POWER LED (green)
This LED turns green when the power is turned on.

7 UID LED (blue)
This LED goes on when the UID switch is pressed. (The LED also goes on or blinks when software issues a command.)

Front View with Front Bezel Removed



1 Captive thumb screws (1 at the right and left each)
The screws secure the server to the rack.

2 Handles (1 at the right and left each)
Hold the handles when dismounting/mounting the server from/in the rack.

3 Hard disk drive bays
Mount hard disk drives in the bays. Each number following the bold-faced number indicates the SAS port number. In the standard configuration, the hard disk drive trays are mounted in all the bays.

4 DISK LED (green/amber)
Hard disk drive LED. Each hard disk drive LED is green during access to the hard disk drive. The LED turns amber when the hard disk drive fails. The LED flashes switching back and forth between green and amber during build processing (in only disk array configuration).

5 CD/FD bay
A DVD-ROM is mounted.

6 DVD-ROM drive
This drive reads data from the disc.
6-1 Emergency hole
6-2 Disk access LED
6-3 Tray eject button

7 USB connectors (2 ports)
Connect device compliant with the USB interface to the connectors.

8 Serial port B (COM B) connector
Used to communicate with the remote console via direct connection.

9 Backup device bay
Mount an optional tape drive in this bay.

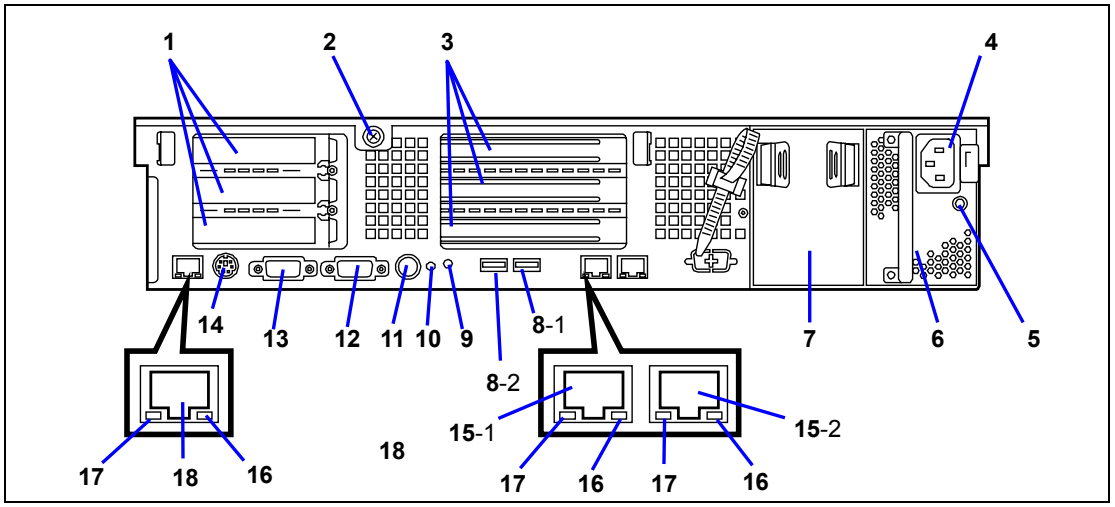
10 UID (Unit ID) switch
Press this switch to turn on/off the UID LEDs on the front and rear panels of the server. Pressing the switch once turns on the LEDs. Pressing it again turns them off.

11 POWER switch
Press this switch to turn on/off the power. Pressing the switch once turns on the power, and the POWER LED goes on. Pressing it again turns off the power. Keep pressing the switch for 4 seconds or more forcibly turns off the power.

12 DUMP switch (NMI switch)
Press this switch to dump memory.

13 LEDs (See the previous page for the six LEDs.)

Rear View



1 Low-profile PCI board extension slots
Mount PCI boards of the low-profile type into the slots. The slots are called 3C, 2C, and 1C from top.

2 Captive thumbscrew
Secure the logic cover.

3 Full-height PCI board extension slots
Mount PCI boards of the full-height type in the slots. The slots are called 3B, 2B, and 1B from top.

4 AC inlet
Connect the attached power cord to this socket.

5 AC POWER LED
This LED turns green and flashes when the power supply receives the AC power from the power cord. The LED grows steadily after supplying the DC power to the system (power-on).
Turns amber when a power failure occurs.
Flashing in amber indicates no AC power is received in the redundant configuration.

6 Power supply unit (power supply slot 1)
This unit supplies power to the server.

7 Power supply unit extension slot (power supply slot 2)
Mount an optional power supply unit in this slot. The slot is protected with the blank cover in the standard status.

8 USB connectors
Connect device compliant with the USB interface to this connector.

9 UID LED (blue)
This LED goes on when the UID switch is pressed. (The LED also goes on when software issues a command.)

10 DUMP switch (NMI)
Press this switch to dump memory.

11 UID (Unit ID) switch
Press this switch to turn on/off the UID LEDs on the front and rear panels of the server. Pressing the switch once turns on the LEDs. Pressing it again turns them off.

12 VGA connector
Connect the display unit to this connector.

13 Serial port A (COM A) connector
Connect device having a serial interface to this connector. Use COM B connector to communicate with the remote console. A leased line cannot be connected directly to this connector.

14 Mouse/keyboard connectors
Connect the mouse and keyboard to the connectors through the provided relay cables.

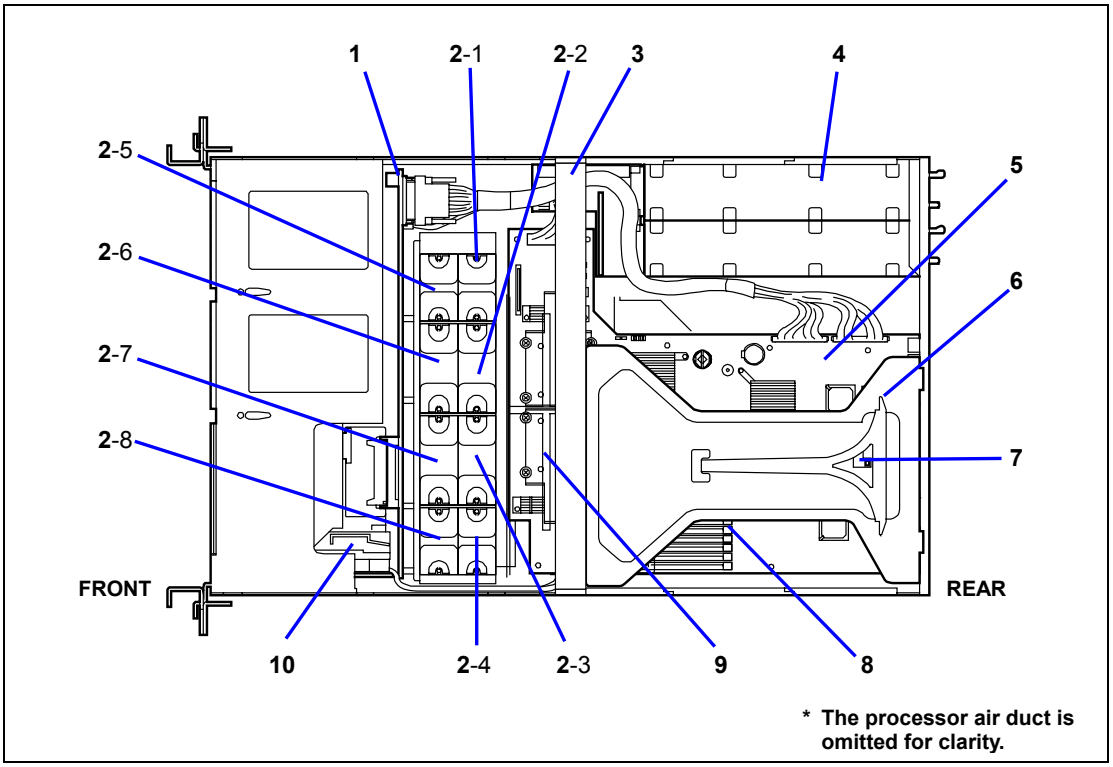
15 LAN connectors
Connect network systems on the LAN to the connectors.
The number "1" following the bold-faced number indicates LAN port 1, and the number "2" indicates LAN port 2.

16 Speed LED (amber)
This LED indicates the transmission speed of the LAN.

17 LINK/ACT LED (green)
This LED indicates the access status of the LAN.

18 Management LAN port
100BASE-TX/10BASE-T interface port used to manage the server via LAN.

Internal View



1 **Backplane**

2 **Cooling fans**

2-1: **FAN1**
2-2: **FAN2**
2-3: **FAN3**
2-4: **FAN4**
2-5: **FAN5 (redundant option)**
2-6: **FAN6 (redundant option)**
2-7: **FAN7 (redundant option)**
2-8: **FAN8 (redundant option)**

3 **Support arm**

4 **Power supply unit**

5 **Mother board**

6 **Riser module**

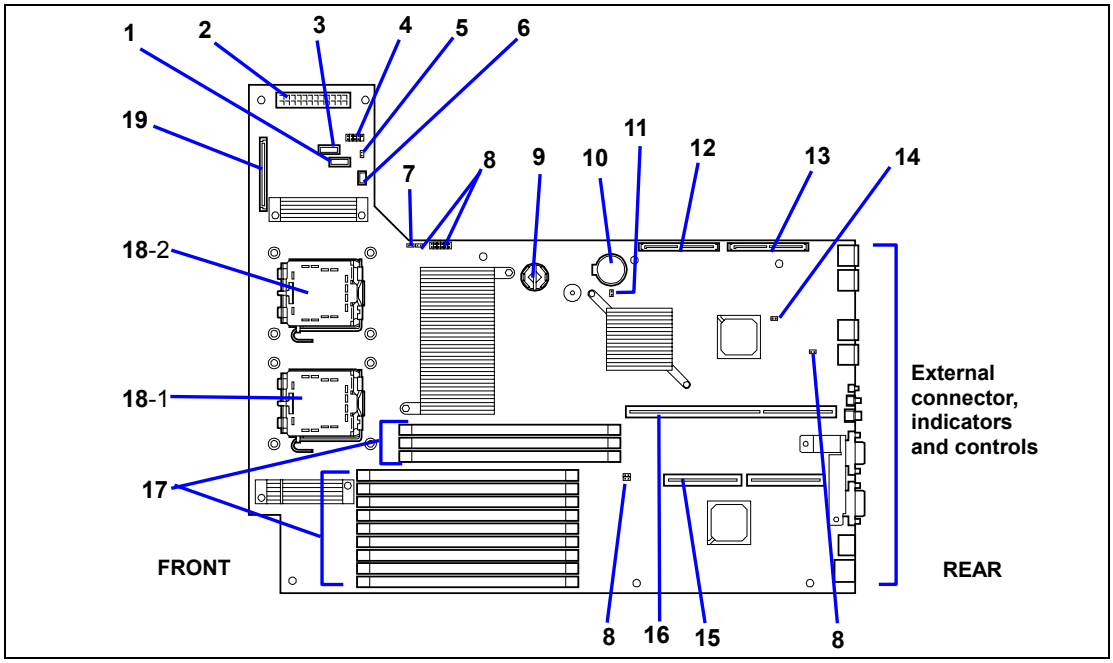
7 **Chassis intrusion switch**

8 **DIMM (Two DIMMs are mounted as standard in slots #11 and #21.)**

9 **Processor (mounted under the heat sink)**

10 **Front panel board**

Mother Board



1 Main power connector
2 Power signal connector
3 USB file device connector
4 USB connector
5 Redundant fan jumper
6 Connectors
Not used in this system.
7 Password clear jumper switch
8 Configuration jumpers
Keep the settings at the factory.
9 RAID socket
Reserved for future use.
10 Lithium battery
11 CMOS clear jumper switch
12 SAS hard drive 2 connector
13 SAS hard drive 1 connector
14 RAID configuration jumper
15 PCI riser slot
(For only low-profile boards)
16 PCI riser card slot
(For full-height boards)
17 DIMM sockets (for the interleave type)
(The sockets are called 41, 42, 43, 11, 12, 13, 21, 22, 23, 31, 32, 33 sequentially from top.)
18 Processor sockets
18-1 Processor #1 (CPU #1) **18**-2 Processor #2 (CPU #2)
19 Backplane connector

STATUS INDICATORS

This section explains the indication and meanings of the server LEDs.

POWER LED ( )

The green POWER LED lights to indicate normal operation while the server is powered. When the server is off-powered, the POWER LED stays unlit.

The POWER LED indicates that the server is running in the power-saving mode (sleep mode). If the OS supports the power-saving mode such as Windows Server 2003, running a command blinks the POWER LED in green and place the server in the power-saving mode. Press the POWER switch to turn out the POWER LED and place the server back in the normal mode.

The power-saving mode is only available when the OS supports the power-saving feature. Some OS's allow you to set the server to automatically turn in the power-saving mode when no access is made to the server for a certain period of time or to select the power-saving mode with a command.

STATUS LED ()

The STATUS LED is on (green) while the server is operating normally. (The rear panel also has the STATUS LED on it.) If the STATUS LED is off or turns amber and flashes, it indicates that the server is in abnormal state.

The table below explains the STATUS LED indication, the meanings, and the procedures.

NOTES:

- If NEC ESMPRO or the offline maintenance utility is installed, you can confirm the cause of a failure by referring to the error log.
- If shutdown processing can be performed through the operating system when you want to restart the system after turning the power off, restart the system by performing shutdown processing. If shutdown processing cannot be performed, restart the system by forcibly turning the power off, or disconnecting and then connecting the power cord.

STATUS LED indication	Description	Procedure
On (green)	The server is operating normally.	–
Flashing (green)	• The server is operating with the memory, CPU in degraded state. • An uncorrectable memory error has often occurred.	Identify the device in degraded state by using the BIOS setup utility "SETUP," and replace it as soon as possible.
Off	The power is off.	–
	POST is in progress.	Wait for a while. The STATUS LED turns green when POST is completed.
	A CPU error occurred. (IERR)	Turn the power off and then turn it on. If the POST screen displays an error message, take notes of the message, and contact your service representative.
	A CPU temperature alarm was detected.	
	A timeout occurred when the time set for the watchdog timer arrived.	
	A CPU bus error occurred.	
	A memory dump request is made.	Wait until the memory dump is completed.
On (amber)	A temperature alarm was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS LED indication does not change when the fans are normal, contact your service representative.
	A voltage alarm was detected.	Contact your service representative.
	All the power supply units failed.	
Flashing (amber)	Either of the following was detected in the redundant power configuration: • AC power not supplied to one of the two power supply units • Failure of one of the two power supply units	Connect the power cord to supply power. If the power supply unit is faulty, contact your service representative.
	A fan alarm was detected.	Check if the fan units are firmly connected. If the STATUS LED indication does not change when the fans are normal, contact your service representative.
	A temperature warning was detected.	Check if the internal fans are clean and if the fan units are firmly connected. If the STATUS LED indication does not change when the fans are normal, contact your service representative.
	A voltage warning was detected.	Contact your service representative.

DISK ACCESS LED ( )

The DISK ACCESS LED indicates the status of the hard disk drive mounted in the 3.5-inch disk bay.

The LED turns green each time access is made to the hard disk drive.

When the DISK ACCESS LED turns amber, it indicates that a hard disk drive failure has occurred. Check the hard disk drive LED for the status of the failing hard disk drive.

> **IMPORTANT:** If a hard disk drive in the server is connected to the internal disk array controller (which is additionally mounted), the access LED signal cable (connected to the connector on the mother board) must be connected from the disk array controller to the mother board.

ACT LED ( )

The ACT LED is green while the server is connected to the LAN. The LED flashes while the server is accessed via the LAN (during transmission/reception of packets). The number next to the icon indicates the network port number on the rear panel of the server.

UID LED (UID)

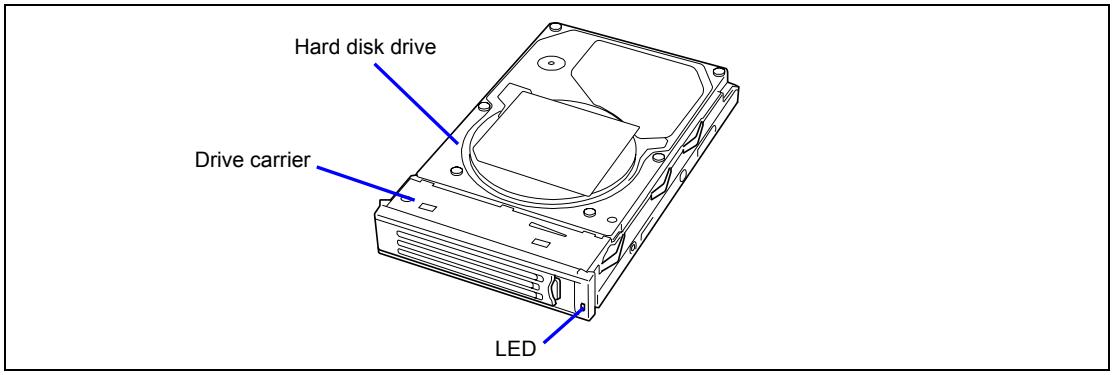
Pressing the UID switch toggles the front panel UID LED (blue) and the mother board UID LED on and off. The mother board UID LED is visible through the rear of the chassis and allows you to locate the server you're working on from the rear of the servers on a rack.

Disk Access LED

The disk access LED of the DVD-ROM drive is on while the drive is accessed.

Hard Disk Drive LED

The disk LED located on the drive carrier indicates the following depending on the status:



- Flashing (green)

  The LED indicates that the hard disk drive is accessed.

- On (amber)

  The LED indicates a failure of a hard disk drive mounted in disk array configuration.

  NOTE: Even if one of the hard disk drives fails in disk array configuration (RAID1 or RAID5), the server can continue operation. However, replace the disk as soon as possible, and perform reconstruction (rebuild) processing. (The failing disk can be replaced in hot swap mode.)

- Flashing switching back and forth between green and amber

  The LED indicates that reconstruction (rebuild) processing is being performed for the hard disk drive. (This flashing does not indicate a failure.) When a failing hard disk drive is replaced in disk array configuration, the system automatically rebuilds the data. (Auto-rebuild function) The LED switches back and forth between green and amber during rebuild processing.

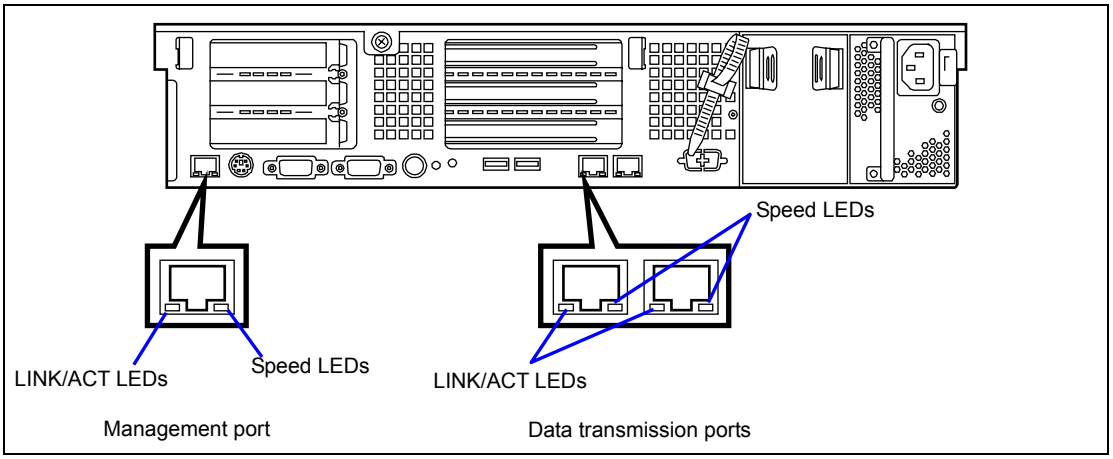
  The LED goes off when the rebuild processing has terminated. It turns amber when the rebuild processing fails.

  IMPORTANT: If the server is turned off during rebuild processing, the processing is stopped. Restart the server, mount the new hard disk drive in hot swap mode, and then perform rebuild processing again. Observe the following notes on using the auto-rebuild function.

  - Do not turn the power off. (Once the power is turned off, the auto-build function does not start.)
  - Let 90 seconds or more pass between when dismounting a failing hard disk drive and when mounting the new one.
  - Do not replace a failing hard disk drive while rebuild processing is being performed for another hard disk drive.

LAN Connector LEDs

There are two LEDs for each of the three LAN ports (connectors) on the rear panel.



- LINK/ACT LEDs

  Each LINK/ACT LED indicates the status of the standard network port of the server. While power is supplied to the server and HUB and the connection is correct, the LED is on (green). The LED turns green and flashes while the network port is transmitting/receiving data.

  If the LED does not go on when the LINK state is placed, check if the network cable is in normal state and if it is connected correctly. If the LED does not go on yet when the network cable is normal, the network (LAN) controller may be faulty. In this case, contact your service representative.

- Speed LEDs (for data transmission ports)

  This LED indicates whether each of the network ports normally equipped with the server is operated through the 1000BASE-T, 100BASE-TX or 10BASE-T network interface. If the LED is lit amber, the network port is operated through 1000BASE-T. If the LED is lit green, the network port is operated through 100BASE-TX. If the LED is off, the network port is operated through 10BASE-T.

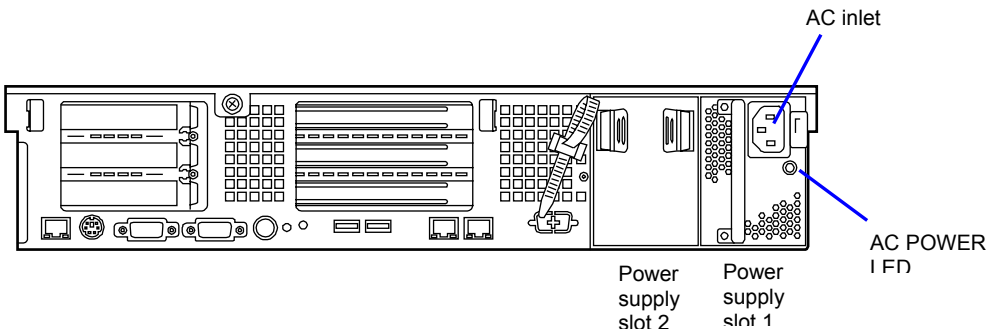
- Speed LED (for management port)

  This LED indicates whether each of the network ports normally equipped with the server is operated through the 100BASE-TX or 10BASE-T network interface. If the LED is lit amber, the network port is operated through 100BASE-TX. If the LED is off, the network port is operated through 10BASE-T.

AC POWER LED

There is an AC POWER LED for the power supply unit on the rear. The LED turns green and flashes when the power supply unit receives AC power from the power cord, which is connected to the AC inlet. (Flashing amber indicates no AC power is received in any one of two power supplies in the redundant configuration.)

The LED turns green when the server power switch is turned on. If the LED does not go on when the server power switch is turned on or if it turns amber, the power supply unit is probably faulty. In this case, contact your service representative to replace the power supply unit.



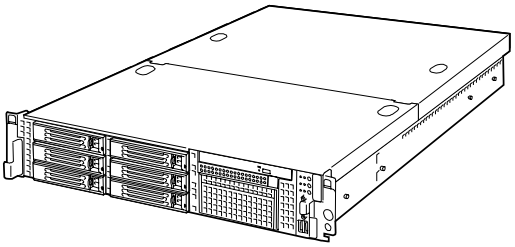
NOTES:

- If one power supply unit fails while an optional power supply is mounted, the system can continue operation with the other power supply unit (redundant function). The failing power supply unit can be replaced in hot swap mode (with the power on) without the system being stopped.
- In configuration of two power units, AC power may be supplied only to a single power unit through the power cord connected to the power unit. If so, the power lamp on the other power unit (to which a power cord is not connected) blinks amber. When a power cord is connected to the power unit to supply AC power, the lamp changes to blink green. If the lamp still blinks amber, contact your service representative to ask maintenance.

STANDARD FEATURES

High performance

- Intel® Xeon® Processor
- High-speed network interface (1000Mbps/100Mbps/10Mbps supported)
- High-speed disk access (Serial Attached SCSI)
- High-speed memory access (DDR2-533 or DDR2-667)



Expandability

- Two PCI EXPRESS (x8) connectors
- Two PCI EXPRESS (x4) connectors
- Two PCI-X (64-bit/66MHz) connectors
- Large memory of up to 48GB
- Six hot-swap SAS hard disk drive bays
- Up to two multi-processors are available for upgrade.
- One backup file bay
- USB2.0 interface (A USB-support driver is required.)

High-reliability

- Remote Management Controller
- Memory monitoring feature (error correction/error detection)
- CPU/memory degradation feature (logical isolation of a failed device)
- Memory chipkill feature
- Memory mirroring/online spare memory feature
- Bus parity error detection
- Temperature detection
- Error notification
- Internal fan monitoring feature
- Internal voltage monitoring feature
- Redundant power supply (hot-swap)
- RoMB (RAID on mother board)
- Auto-rebuild feature (hot-swappable)
- BIOS password feature
- Mechanical security lock
- Redundant fans

Many Available Features

- El Torito Bootable CD-ROM (no emulation mode) format support
- POWER switch mask
- Software power-off
- Remote power-on feature
- AC-Link feature
- Consoleless feature

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D)

Management Utilities

- NEC ESMPRO
- NEC DianaScope

Maintenance Features

- Off-line Maintenance Utility
- Memory dump feature using the DUMP switch

Easy and Fine Setup

- NEC EXPRESSBUILDER (system setup utility)
- Configuration Parameter Diskette Creator
- SETUP (BIOS configuration utility)
- Software RAID Setup Utility (Onboard RAID configuration utility)

Remote Management Feature

Server management is concentrated in the Remote Management Controller (RMC). The RMC and associated circuitry are powered from a 5Vdc standby voltage, which remains active when system power is switched off, but the ac power source is still on and connected.

The RMC supports the NEC DianaScope, which allows remote server management through networks. Events monitored by the manager system include over-temperature and over-voltage conditions, fan failure, or chassis intrusion.

Information on NEC DianaScope may be found in the NEC EXPRESSBUILDER CD-ROM.

One major function of the RMC is to autonomously monitor system management events, and log their occurrence in the nonvolatile System Event Log (SEL). The events being monitored include overtemperature and overvoltage conditions, fan failure, or chassis intrusion. To enable accurate monitoring, the RMC maintains the nonvolatile Sensor Data Records (SDRs), from which sensor information can be retrieved. The RMC provides an ISA host interface to SCR sensor information, so that software running on the server can poll and retrieve the server's current status.

The RMC performs the following:

- Monitors server board temperature and voltage*
- Monitors processor presence and controls Fault Resilient Boot (FRB)
- Detects and indicates baseboard fan failure*
- Manages the SEL interface
- Manages the SDR Repository interface
- Monitors the SDR/SEL timestamp clock
- Monitors the system management watchdog timer
- Monitors the periodic SMI timer
- Monitors the event receiver
- Controls secure mode, including video blanking, diskette write-protect monitoring, and front panel lock/unlock initiation
- Controls Wake On LAN via Magic Packet support.

*Also, NEC ESMPRO supports these features.

Degradation Feature

The degradation feature automatically isolates a failed DIMM or processor to assure continuous operation of the server when the POST (Power On Self-Test, self-diagnosis program after power on) detects such a DIMM or processor.

> **NOTE:** The degradation feature is only available when at least two DIMMs or processors are installed.

Failed DIMMs and processors may be identified on the screen that the POST displays, or with the BIOS setup utility of the server, "SETUP." They may also be identified on the system that has the NEC ESMPRO installed.

Memory RAS Features

Your server board has the memory mirroring and online spare memory features. For detail explanation, refer to Chapter 9.

Remote Power-On Feature (Wake On LAN)

The remote power-on function turns on the server through a network. It sends a special packet from the management computer to a remote server to turn it on if the server is off-powered.

To enable this feature, use the BIOS setup utility, "SETUP." (See Chapter 4.)

The remote power-on feature is not available in the following cases. Press the POWER switch once to start the OS, and turn off the server in an appropriate procedure.

- Abnormal previous system shut-down
- No power supply to the server (due to turned-off breaker, disconnected power cord, power blackout, etc.)

AC-Link Feature

When the power cord of the server is connected to an uninterruptible power supply (UPS) unit, the server supports the power linkage feature that enables control over the power supply from the UPS to the server. The AC-Link feature can be enabled or disabled with the Server menu of the BIOS setup utility, "SETUP." (See Chapter 4.)

System Security

To help prevent unauthorized entry or use of the system, the system includes a full lockable front bezel and Server Management software that monitors the front bezel intrusion switch.

Security with Mechanical Locks and Monitoring

To unlock the bezel, insert the key in the lock and turn the lock counterclockwise until it stops (about a quarter turn). The bezel is now unlocked and can be opened again.

To lock the bezel, insert the key in the lock. Turn the lock clockwise until it stops (about a quarter turn). The bezel is now locked and cannot be opened.

Software Locks via the BIOS SETUP Utility

The BIOS SETUP Utility provides a number of security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, you can access the system only after you enter the correct password(s). For example:

- Mask the power switch function after the power-on.
- Set and enable a supervisor password.
- Set and enable a user password.
- Disable access to the boot sector of the operating system hard disk drive.

NEC EXPRESSBUILDER

The CD-ROM that comes with the server contains a setup utility called "NEC EXPRESSBUILDER."

The major functions of the NEC EXPRESSBUILDER are:

- To install the Operating System.
  "Express Setup" helps you to install the Windows Operating System. (See Chapter 5)
- To diagnose the system.
  NEC EXPRESSBUILDER includes the System Diagnostics to check your server. (See Chapter 6)
- To create a support disk.
  Use this function to create the support disks used to boot the utilities from the floppy disk, or the OEM-disk used for a manual installation of Windows. (See Chapter 6)
- To update the BIOS.
  Use this function to update the system BIOS or firmware of the server. (See Chapter 6)
- To update the Windows System*
  "Update Express5800 system" in Master Control Menu (Windows-based NEC EXPRESSBUILDER feature) updates the several resources of Microsoft Windows Server 2003. (See Chapter 6)
- To install the utilities.
  NEC EXPRESSBUILDER includes some management software for Windows (NEC ESMPRO, NEC DianaScope and so on) and maintenance utilities for DOS (System diagnostics, Off-line Maintenance Utility and so on).
  You can install the applications for Windows from Master Control Menu and install the utilities for DOS from Tools menu. (See Chapter 6)
- To read the online documents*
  You can refer to the online documents from Master Control Menu. (See Chapter 6)

  * These functions are available under the Windows system.

NOTE: Some features among those listed above can be used from the remote computer via cross cable (COM), or LAN. See Chapter 6 for details.

NEC ESMPRO

The NEC ESMPRO is server management software that runs on the OS. The NEC ESMPRO includes the NEC ESMPRO Manager for the server monitoring terminal and the NEC ESMPRO Agent for the server.

> **NOTE:** For details of major functions of the NEC ESMPRO, system configuration and setups with the NEC ESMPRO, see Chapter 6. Available functions of the NEC ESMPRO depend on the OS you install. Ask your service representative for details.

OFF-LINE MAINTENANCE UTILITY

The Off-line Maintenance Utility is used for maintenance and fault analysis of the server. This utility is usually used by the service representative.

Refer to Chapter 8 for details.

SYSTEM DIAGNOSTIC UTILITY

The system diagnostic utility contained in the NEC EXPRESSBUILDER is useful to detect hardware failures. See Chapter 7 for details.

NEC DianaScope

The NEC DianaScope is a software for the remote management of the server. The NEC DianaScope can control the managed server even if OS is not running on the managed server.

See Chapter 6 and online document in the NEC EXPRESSBUILDER.

USING YOUR SERVER

This section describes basic operations of the server including how to use devices such as the DVD-ROM drive. See Appendix B for notes on using the disc and accessories including the keyboard and the mouse.

Front Bezel

Remove the front bezel to power on/off the server, to access the DVD-ROM drive, and a removable media device, and to install/remove hard disk drives to the 3.5-inch disk bays.

IMPORTANT:

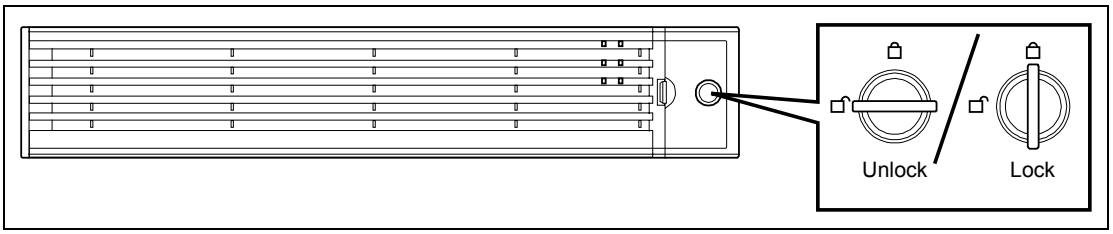
- To open the front door, you must unlock the door with the provided security key.
- Pay attention not to press the POWER switch when you install or remove the front bezel.

Installing or Removing the Front Bezel

When turning the power of the server on/off, accessing to the DVD-ROM drive, or a removable media device, or installing or removing a hard disk drive on or from the 3.5-inch disk bay, first remove the front bezel.

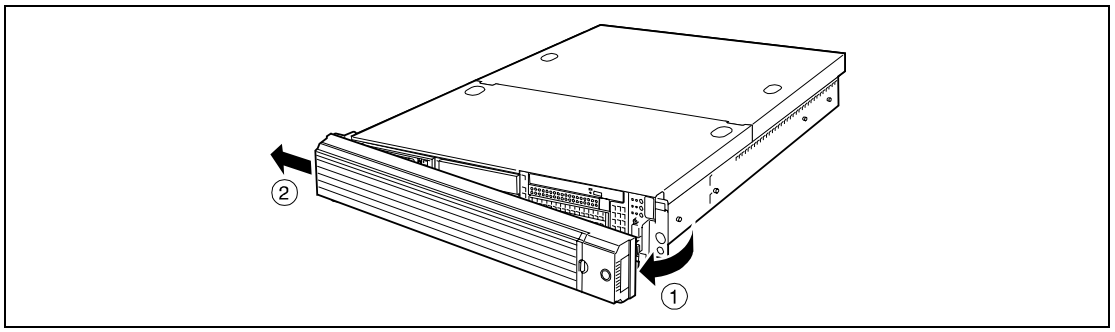
IMPORTANT: The front bezel can be opened only when you unlock it by using the attached security key.

1. Insert the attached security key into the key slot and turn the key to the front bezel side with it pressed lightly to release the lock.

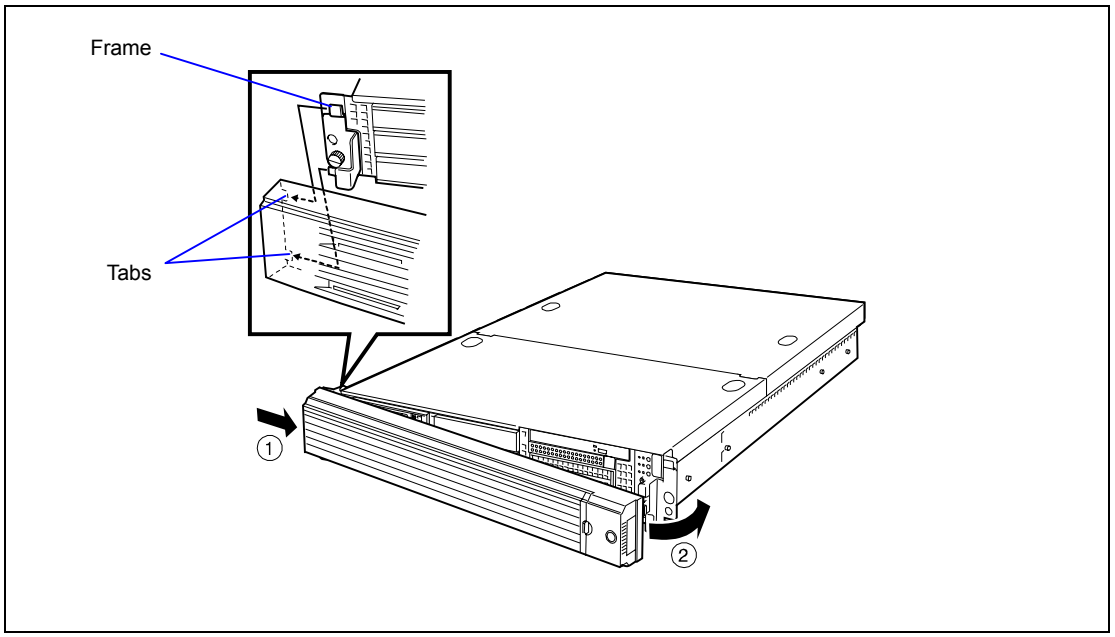


2. Hold the right end of the front bezel lightly to pull it toward you.

3. Slide the front bezel to the left a little to remove the tab from the frame and then remove the front bezel from the server.



To install the front bezel, latch the tab at the left side of the front bezel on the server frame. After the installation, lock the front bezel by using the key for security.



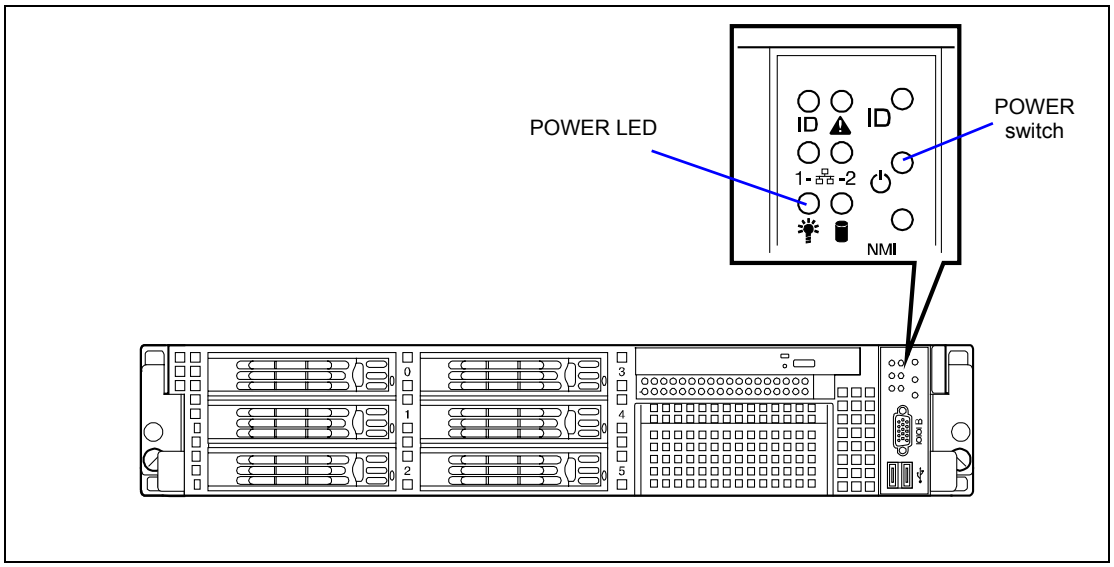
POWER Switch

Use the POWER switch to turn on/off the server.

Power On

Press the POWER switch on the front of the computer chassis.

The POWER LED lights in green.



IMPORTANT:

- If the power cord is connected to a power control device such as a UPS (Uninterruptive Power Supply), make sure that the power control device is powered.
- The server management logic on your system board monitors and logs system voltage changes. When plugging the power cord to the system, you may experience 30 seconds delay from the time you press the POWER switch on the front panel. This is normal system operation and is required by the server management logic.
- Always allow POST to complete before powering down your system.

POST

POST (Power On Self-Test) is the self-diagnostic program stored in the system memory.

When you power on the server, the system automatically runs POST to check the mother board, ECC memory module, CPU module, keyboard, and mouse. POST also displays messages of the BIOS setup utility, such as the start-up message, while in progress.

With the factory setup of the server, the NEC logo appears on the display unit while POST is in progress. (To display the POST check results, press **Esc**.)

> **NOTE:** You can set the POST check results to appear on the display unit without pressing **Esc**. To do so, select "Enabled" for "Boot-time Diagnostic Screen" under the Advanced menu of the BIOS SETUP utility.

The POST check results should be checked in the following cases.

- When the server is used for the first time.
- When the server appears to fail.
- When the server beeps for many times between power-on and OS start-up.
- When an error message appears on the display unit.

POST Execution Flow

The following describes the progress of POST in the chronological order.

IMPORTANT:

- Do not make key entries or perform mouse operations while POST is in progress.
- Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by BIOS of an installed optional board. Make sure to read the manual that comes with the optional board before any key entry.
- Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the message that indicates incorrect board configuration and suspend POST. In such a case, press **F1** to continue POST. Board configuration can be made using the utility described later.

1. After a few seconds from power-on, POST starts checking the memory. The count message of the basic and expansion memory appears at top left on the display unit screen. The memory check may takes a few minutes to complete depending on the memory size of the server. Also, it may take approximately one minute for the screen display to appear after rebooting the server.
2. Some messages appear upon completion of the memory check. These messages appear to indicate that the system has detected the CPU, baseboard management controller, keyboard, and mouse.
3. After a few seconds, POST displays the following message prompting you to launch the BIOS SETUP utility stored in the system memory of the server. This message appears at bottom left on the screen.

   ```
   Press <F2> to enter SETUP, <F4> Service Partition, <F12> to Network
   ```

   Launch the BIOS setup utility when you need to change the settings to meet the requirements for the server. As long as the above message is not displayed with an error message, you don't have to launch the utility. (Ignore the message. POST will automatically proceed.)

   To launch the SETUP utility, press **F2** while the above message is displayed. See Chapter 4 for setup and parameters.

   The server automatically restarts POST all over again when you exit the SETUP utility.

   The message "<F4> Service Partition" is displayed if you have created a maintenance partition during setup using Express Setup. Press **F4** to boot the system from maintenance partition. See Chapter 6 for details.

   The message "<F12> to Network" prompts you network booting (PXE boot). If you press **F12**, the POST searches for boot device on network.

4. If your server uses onboard RAID feature, the following message is displayed to prompt you to run RAID utility.

   ```
   Press <Ctrl><M> to run LSI Logic SoftwareRAID Setup Utility
   ```

   Press **Ctrl** + **M** to run the utility. For detail explanation, see Chapter 4 for detail.

   IMPORTANT: The LSI Logic Software RAID Setup Utility is used to manage the data stored in hard disk drive, or for maintenance. See Chapter 4 for detail.

5. If the POST detects the optional add-in card, it display the message prompting you to launch the add-in card BIOS configuration utility. (Ignore the message. POST will automatically proceed a few seconds later.)

   Refer to the manual that comes with the optional add-in card for detail.

6. If you set a password using the BIOS setup utility, SETUP, the password entry screen appears upon successful completion of POST.

   Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

   IMPORTANT: Do not set a password before installing an OS.

7. The OS starts when POST completes.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. See Chapter 8 for POST error codes.

> **IMPORTANT:** Take a note on the messages displayed before consulting with your service representative. Alarm messages are useful information for maintenance.

Power Off

Follow the procedure below to power off the server. If the power cord of the server is connected to a UPS, refer to the manual that comes with the UPS or the manual for the application that controls the UPS.

> **IMPORTANT:** Always allow POST to complete before turning off the server.

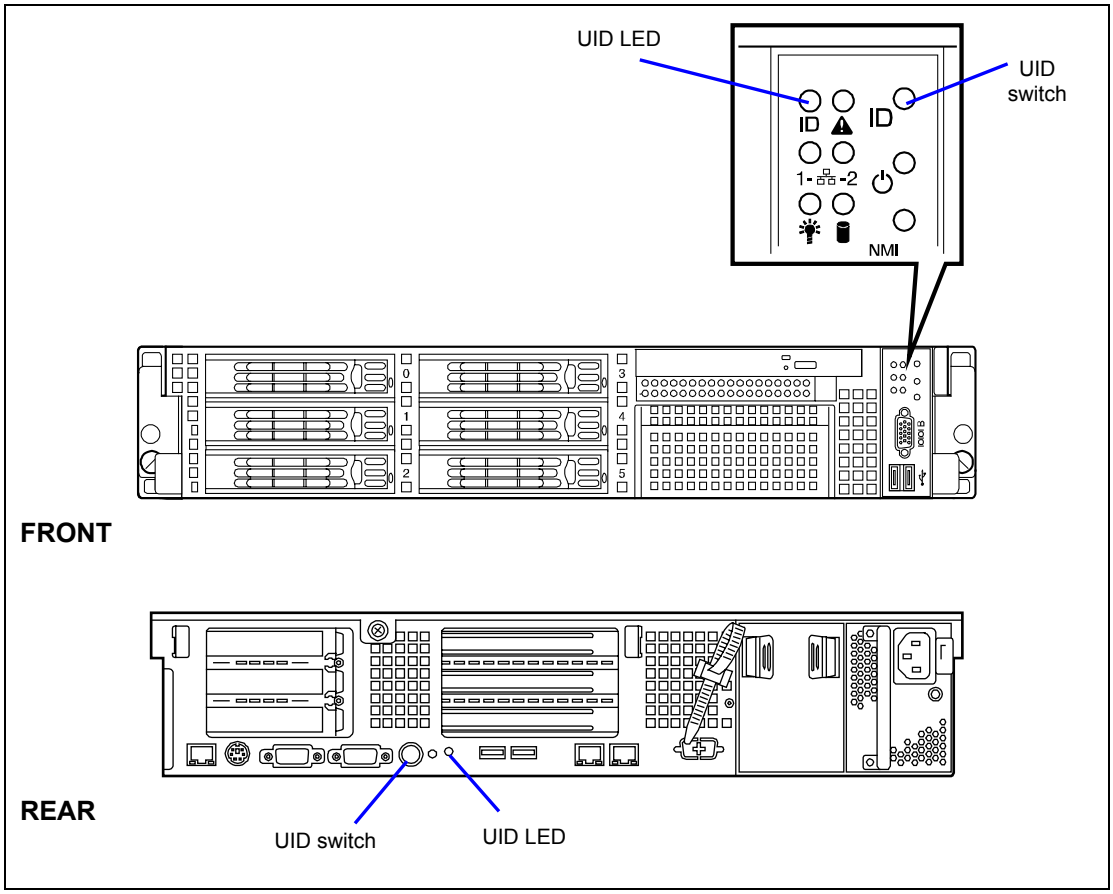
1. Shut down the OS.
2. Press the POWER switch on the front of the server.
   The POWER LED goes off.
3. Power off peripheral devices.

Identification of Servers (UID Switch)

An "UID (Unit ID) LED" is provided on the front panel and rear panel. If more than one server is mounted in a single rack, the LED identifies the server you are going to maintain.

The UID LED goes on when the UID (Unit ID) switch on the front panel is pressed. It goes off when the switch is pressed again.

Maintenance from the rear of the rack has to be carried out in a dark, narrow space. The interface cable of a server or power supply unit in normal state may be disconnected by accident in this situation. To prevent this problem, you should start maintenance after confirming the target server by using the UID switch.



DVD-ROM Drive

The server is provided with the DVD-ROM drive on its front to read data from a disc.

⚠ CAUTION

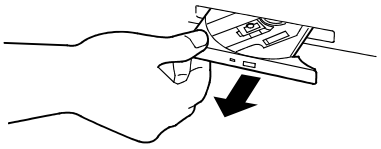
Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not leave the tray ejected from the DVD-ROM drive.

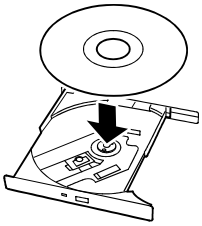
Set a disc on the DVD-ROM drive in the following procedure.

1. Confirm that the power of the server is on (with the POWER LED being lit in green) before setting the disc on the DVD-ROM drive.
2. Press the Eject button on the front of the DVD-ROM drive.

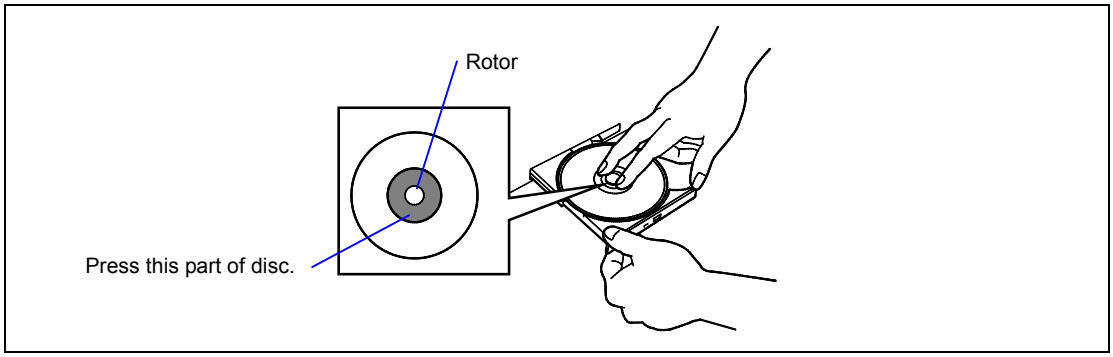
   The tray comes out a little.
3. Hold the tray lightly and pull it out toward you until the tray stops.



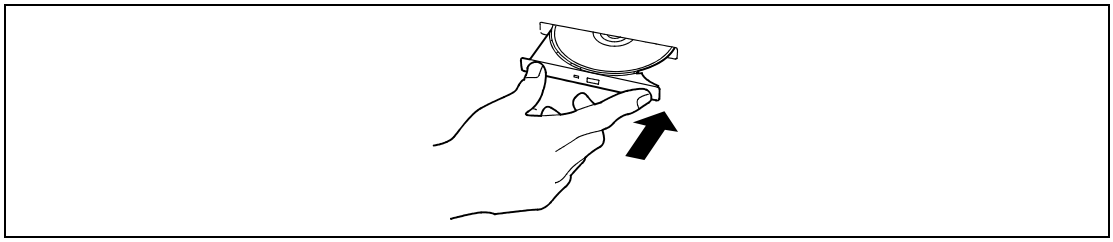
4. Put the disc on the tray carefully and securely with the character printed surface facing upward.



5. As shown in the figure below, hold the tray with a hand and press the disc with fingers of another hand to make the hole of the disc fit to the rotor at the center of the tray.

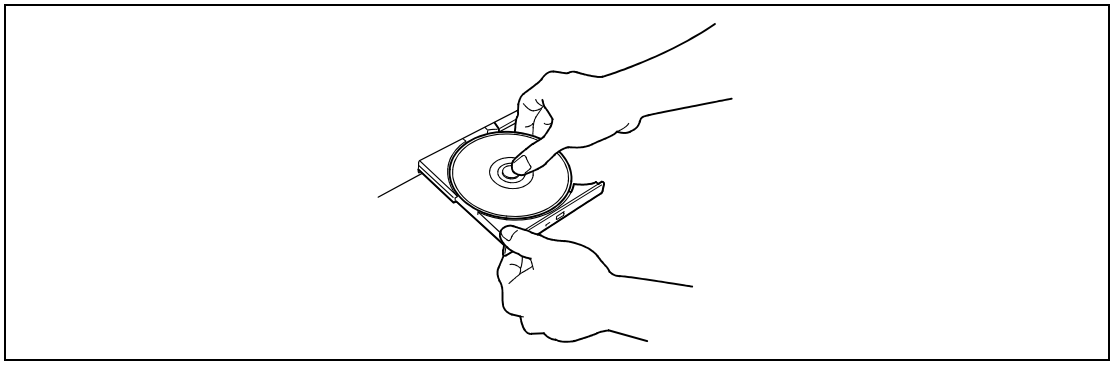


6. Push the front of the tray lightly to retract it into the drive.



IMPORTANT: If a noisy sound in driving the DVD-ROM drive occurs after setting a disc, set it again correctly.

To take out the disc from the DVD-ROM drive, press the Eject button in the similar way in setting the disc to make the tray go out.

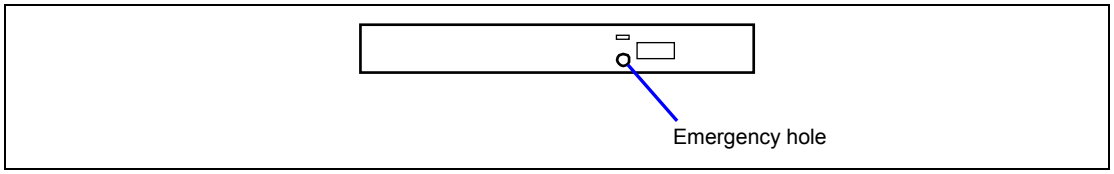


If the access LED is lit in orange, the disc is being accessed. Confirm that the access LED is not lit before pressing the Eject button.

As shown in the figure below, hold the tray with a hand and take the end of the disc lightly by the fingers of another hand with the suppression of the rotor at the center of the tray to remove the disc from the tray.

After taking out the disc, return the tray into the drive.

When you fail to eject the tray with the Eject button and take out the disc from the server, follow the procedure below.



1. Press the POWER switch to power off the server. (The POWER LED goes off.)
2. Insert a metal pin of approximately 1.2 mm in diameter and 100 mm in length (a straightened large paper clip will make a substitute) into the emergency hole on the right front of the DVD-ROM drive and gently push it in until the tray is ejected.

IMPORTANT:

- Do not use a toothpick or plastic stick that is easy to break.
- If the above procedure does not let you take out the disc, contact your service representative.

3. Hold the tray and pull it out.
4. Take out the disc.
5. Push the tray back into position.

NOTE: Use of the Disc

Keep the following notes in mind to use the disc for the server:

- For the disk which does not conform to the CD standard, the playback of such a disk with the CD drive is not guaranteed.
- Do not drop the disc.
- Do not place anything on the disc or bend the disc.
- Do not attach any label onto the disc.
- Do not touch the signal side (nothing is printed on this side) with your hand.
- Place the disc with its printed side upward and gently put it on the tray.
- Do not scratch the disc or write anything directly on it with a pencil or ball-point pen.
- Keep the disc away from cigarette smoke.
- Do not leave the disc in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- When dust or fingerprints are attached on the disc, wipe the disc from its center to edge with a dry soft cloth slowly and gently.
- Use the CD cleaner to clean the disc. Do not use record spray/cleaner, benzene, or thinner.
- Keep the disc in a disc case when not in use.
- If the disc emits large noise in the DVD-ROM drive, remove the disc and insert it back again.

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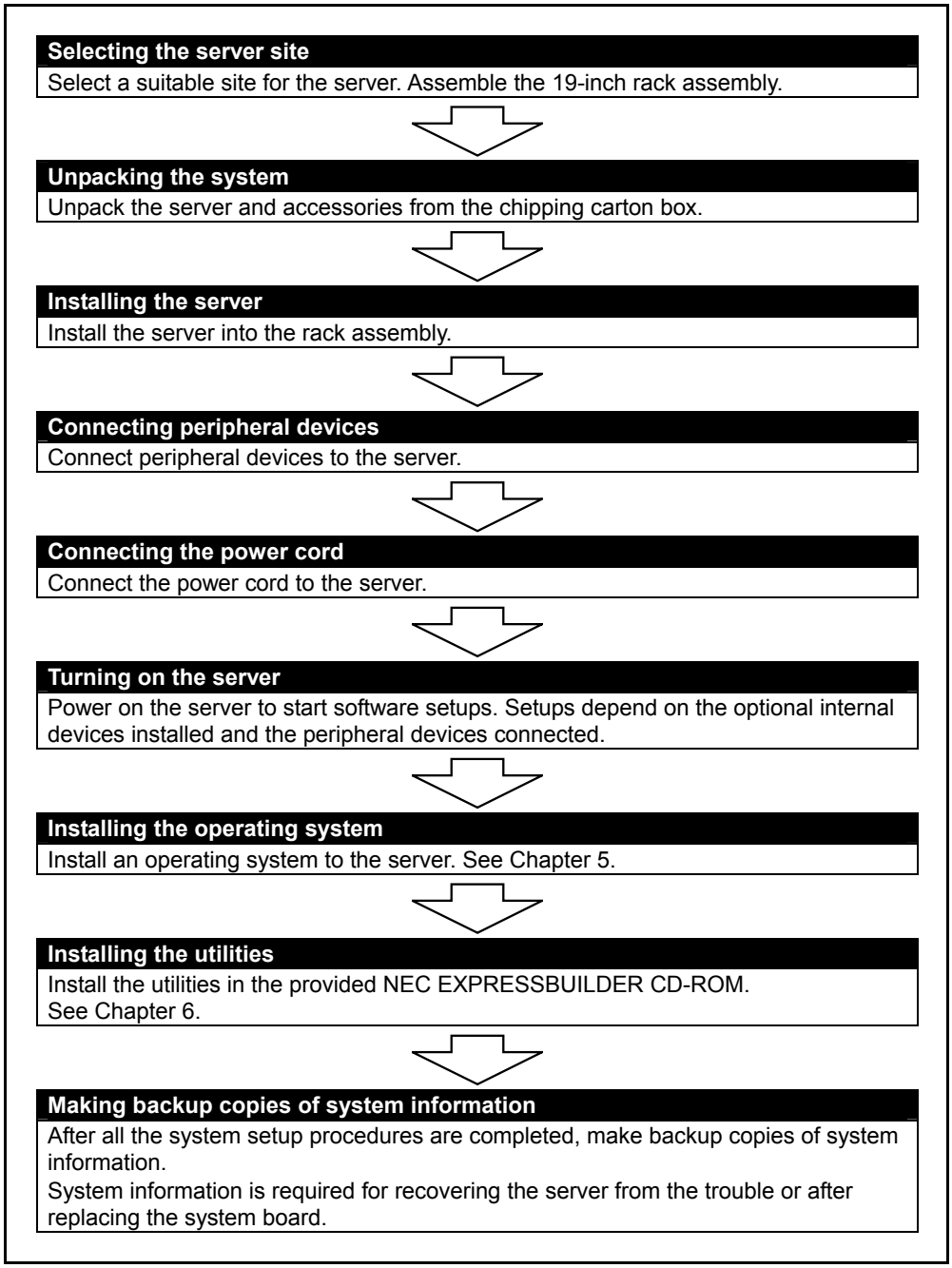
Chapter 3

Setting Up Your Server

This chapter describes how to set up the server appropriate for your system, on a step-by-step basis.

SETUP FLOW

Follow the flowchart below to set up the server.


Selecting the server site
Select a suitable site for the server. Assemble the 19-inch rack assembly.
Unpacking the system
Unpack the server and accessories from the chipping carton box.
Installing the server
Install the server into the rack assembly.
Connecting peripheral devices
Connect peripheral devices to the server.
Connecting the power cord
Connect the power cord to the server.
Turning on the server
Power on the server to start software setups. Setups depend on the optional internal devices installed and the peripheral devices connected.
Installing the operating system
Install an operating system to the server. See Chapter 5.
Installing the utilities
Install the utilities in the provided NEC EXPRESSBUILDER CD-ROM.
See Chapter 6.
Making backup copies of system information
After all the system setup procedures are completed, make backup copies of system information.
System information is required for recovering the server from the trouble or after replacing the system board.

SELECTING SERVER SITE

To use the server, install it on a standard EIA 19-inch rack assembly.

Refer to the documentation attached to the rack or contact your service representative for the installation of the server on the rack.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not use the server in any unapproved place.
- Do not connect the ground line to a gas pipe.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not carry or install the server only by a single person.
- Do not install the server where the load may be concentrated on a specific point.
- Do not install any component on the server only by a single person.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.
- Do not provide the wiring exceeding the rating power.

Do not install the rack in the places listed below. Installing the rack or mounting the server on the rack in such a place may cause some malfunction to occur.

- Narrow space from which devices cannot be pulled out from the rack completely
- Place that cannot bear the total weights of the rack and devices mounted on the rack
- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where corrosive gas is generated, chemicals are nearby, or chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid.
- Place where some objects may be fallen on the rack
- Place near a device generating intense magnetic field (such as a TV, radio, broadcast/communication antenna, power transmission wire, and electromagnetic crane) is placed (If unavoidable, contact your service representative to request proper shield construction.)
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption.
- Place near equipment that generates power noise (e.g., contact spark at power-on/power-off of commercial power supply through a relay). If you must install the server close to such equipment, request your service representative for separate power cabling or noise filter installation.

UNPACKING THE SYSTEM

When you receive your system, inspect the shipping containers prior to unpacking. If the shipping boxes are damaged, note the damage, and if possible, photograph it for reference. After removing the contents of the containers, keep the cartons and the packing materials. If the contents appear damaged when you unpack the boxes, file a damage claim with the carrier immediately.

INSTALLING THE SERVER

This subsection provides the instructions for the rack-mount server unit into a standard EIA 19-inch rack cabinet.

Also this subsection describes the removal procedures for the rack-mount server unit from the 19-inch rack cabinet.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not use any rack which does not conform to the relevant standard.
- Disconnect the power cord(s) before installing or removing the server.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not leave more than one device being pulled out from the rack.
- Do not lift the server only by a single person.
- Always install the server in the specified place.
- Do not install the server on the rack leaving the cover removed.
- Do not pinch your finger with mechanical components.

Restricted Access Location

The server is intended for installation in a restricted access location, mounted above a non-combustible material.

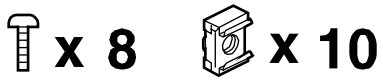
ESD Precaution

An electrostatic discharge (ESD) can damage disk drives, option boards, and other components. You can provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground when handling system components.

Electronic devices can be easily damaged by static electricity. To prevent damage, keep them in their protective packaging when they are not installed in your system.

Checking Components

Confirm that the following tools or components are provided to install the server on the rack.



M5 screw M5 cage nut

Required Tools

You may only prepare a Phillips screwdriver to install the server on the rack.

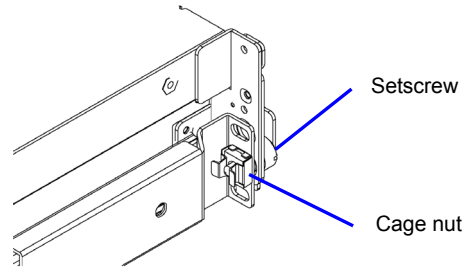
Installation Procedure for NEC Rack/Third Vendor's Rack

This server can be installed in either the NEC rack or a third vendor's rack. Take the following procedure to install the server in the rack:

> **IMPORTANT:** When installing the optional cable arm, see the instruction manual provided with the cable arm.

Preparation before Installation

The slide rail is fixed with the screw to prevent from falling off during transportation. Remove the left and right cage nuts from the front of the server before you install the server in the rack.



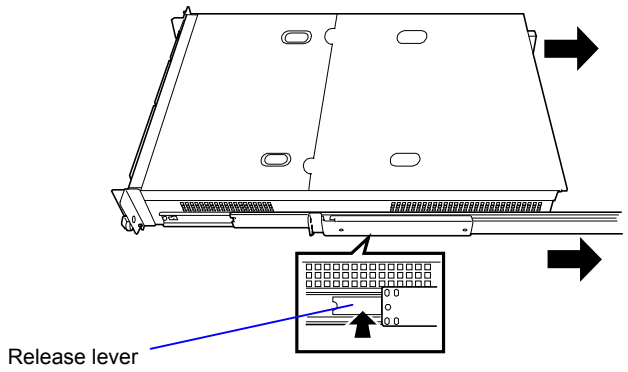
Hold the cage nut, and rotate the set screw to remove the cage nut.
Keep the removed cage nuts for future use.

Removing the Rail Assemblies

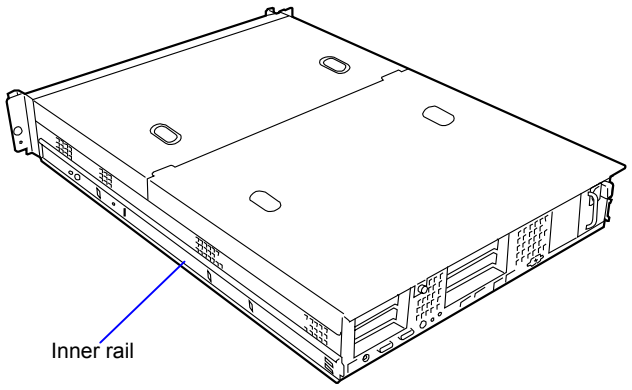
Remove the sliding rails from the server.

Hold the rails and slowly slides them toward the rear of the server until a "click" is heard. The click indicates that the rails are locked.

Push the release levers on the right and left sides of the server, and remove the rail assemblies from the server while unlocking.



Only the inner rails remain screwed to the server when the rail assemblies have been removed.

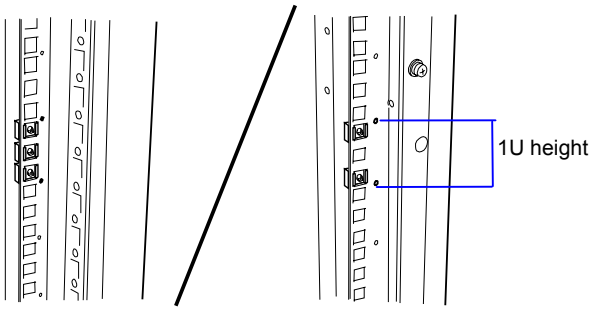


IMPORTANT: The removed rail assemblies are to be installed on the inner rails later. To install each rail assembly on the correct inner rail, make a mark on the assemblies. Similarly, when installing more than one server, distinguish between the pairs of inner rails and rail assemblies of the servers by making marks.

Installing the Cage Nuts

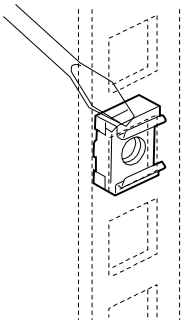
Install three cage nuts on the front of the rack for each of the right and left sides and also two cage nuts on the rear of the rack for each of the right and left sides.

Install three cage nuts in 1U (the minimum unit of rack height). Three slots (angle holes) are opened per 1U of a rack. Install the cage nuts at the three slots. (For any NEC rack, round marks are put in the unit of 1U.) For two cage nuts installed on the front of the rack, the upper and lower nuts are used to fix the front of the rail assembly, and the center is used to support the setscrew of the server. The cage nuts installed on the rear of the rack are used to fix the rear of the rail assemblies.



Hang either clip of a cage nut on a square hole on the rack and insert another clip into the hole by using a tool such as a flat tip screwdriver.

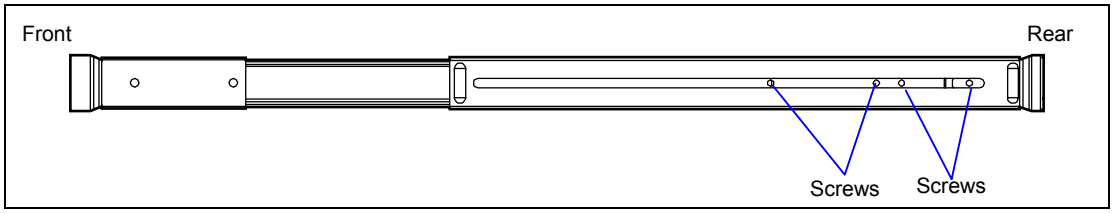
NOTE: Confirm that all the cage nuts are installed at the level.



Installing the Rail Assemblies

Make sure of the right side rail assembly or the left one when installing it. See the figure below.

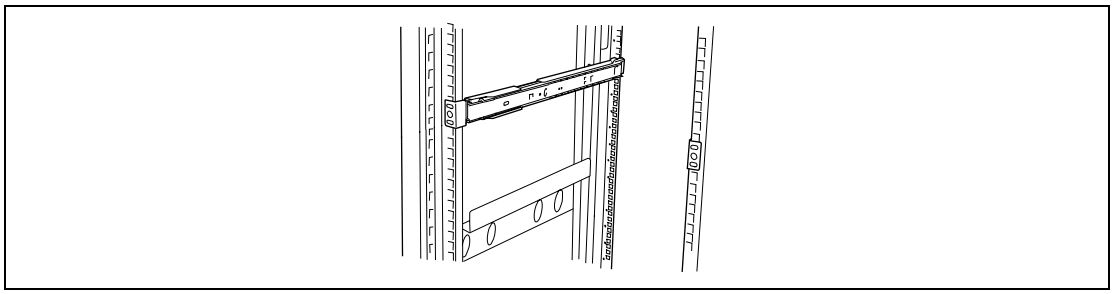
1. Loosen a screw securing the rail assembly.



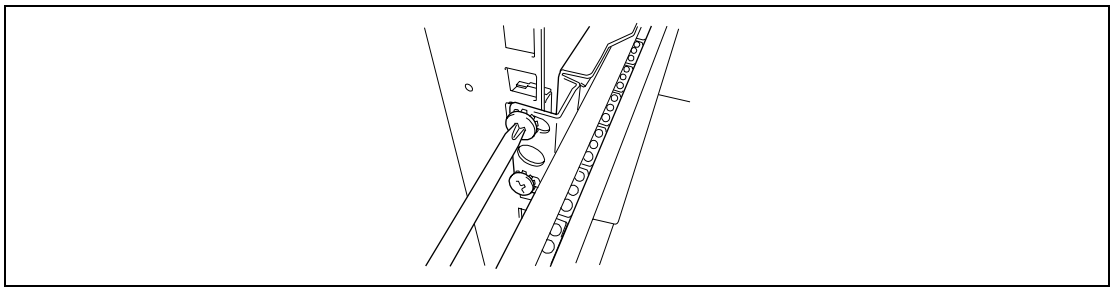
2. Align the front and rear frames of rail assembly to the location where the cage nuts are installed.

   Locate the rail assembly so that the frame of the rack is located between cage nuts and frames of rail assembly.

   NOTE: Confirm that the portion of the frame to fix the rail assembly is located in front of the rack frame.



3. Firmly secure the rail assembly.



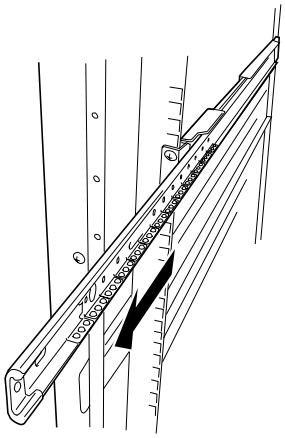
Installing the Server

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not lift the server only by a single person.
- Do not pinch your finger with mechanical components.

1. Pull out the sliding rails of the right and left rail assemblies until they are locked.

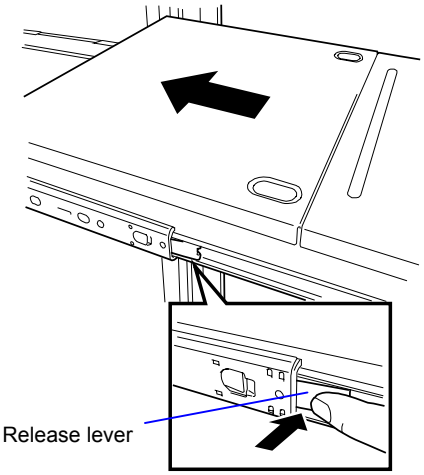


2. At least two persons are required to install the server. Securely hold the server and install it in the rack.

Firmly fit the inner rails on the sides of the server into the rail assemblies that are installed on the rack, and then slowly push the server into the rack.

If the server is locked on its way into the rack, slowly push it in while pressing the release levers on the right and left sides of the server.

When the server is installed for the first time, the mechanical parts are rather hard to slide. You may feel strong friction when pushing in the server. In this case, strongly push it in.

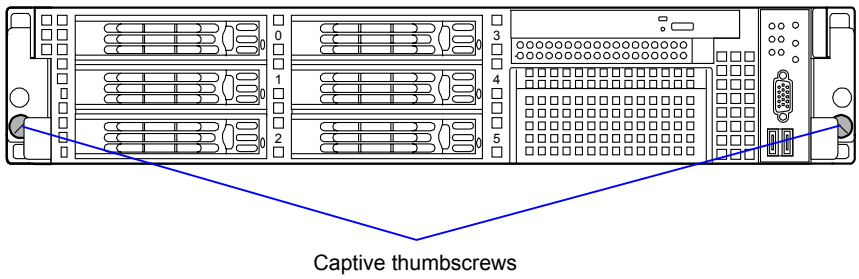


3. Confirm that the sliding rails work normally by pulling the server out of the rack and pushing it in several times.

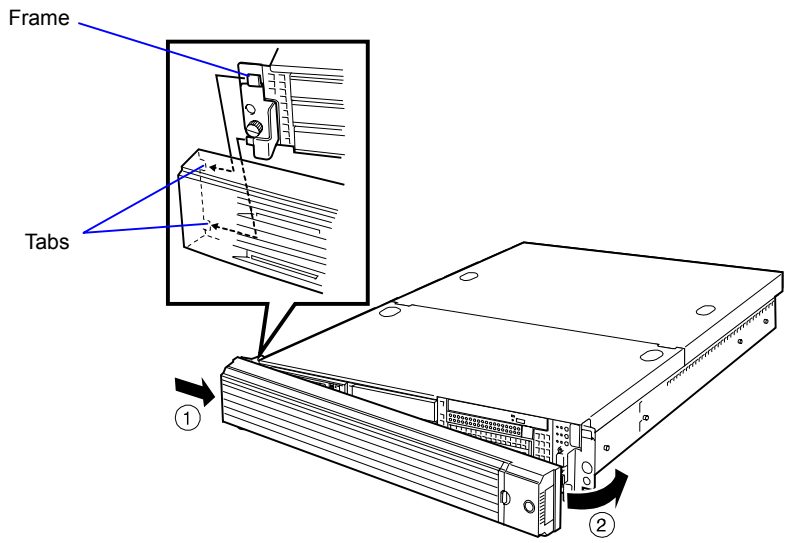
NOTE: Confirm that the sliding rails work normally. If the sliding rails are stuck to the rack frame and do not come out, reinstall them.

Securing the Server

1. Push the server into the rack as far as it will go.
2. Tighten the right and left captive thumbscrews on the front panel to secure the server to the rack.



3. Install the front bezel.



This completes the installing of the server.

Removing the Server from the Rack Assembly

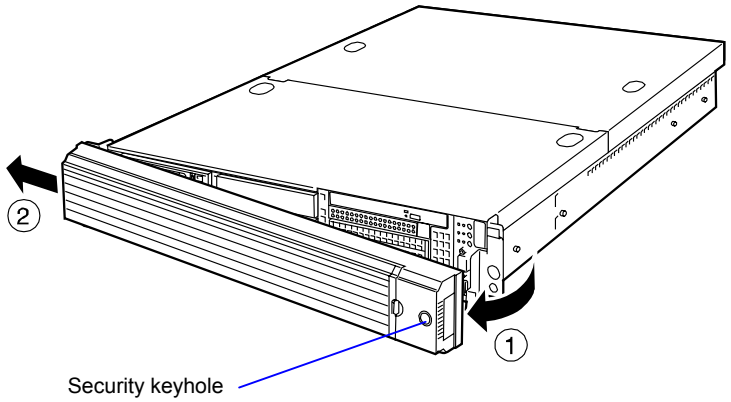
The server should be removed from the rack by at least two persons.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not lift the server only by a single person.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

1. Confirm that the power of the server is OFF, and disconnect the power cable and all the interface cables connected to the server.
2. Release the security lock to remove the front bezel.

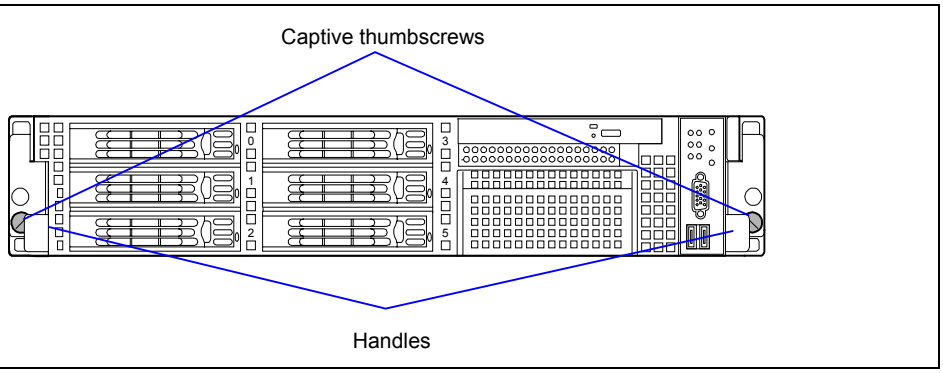


3. <This step is required only when the optional cable arm is mounted.>

   Remove the two screws securing the cable arm, and dismount the cable arm from the server.

4. Loosen the two captive thumbscrews.
5. Hold the handle and pull out the server from the rack slowly and carefully.

   The server clicks to be latched.

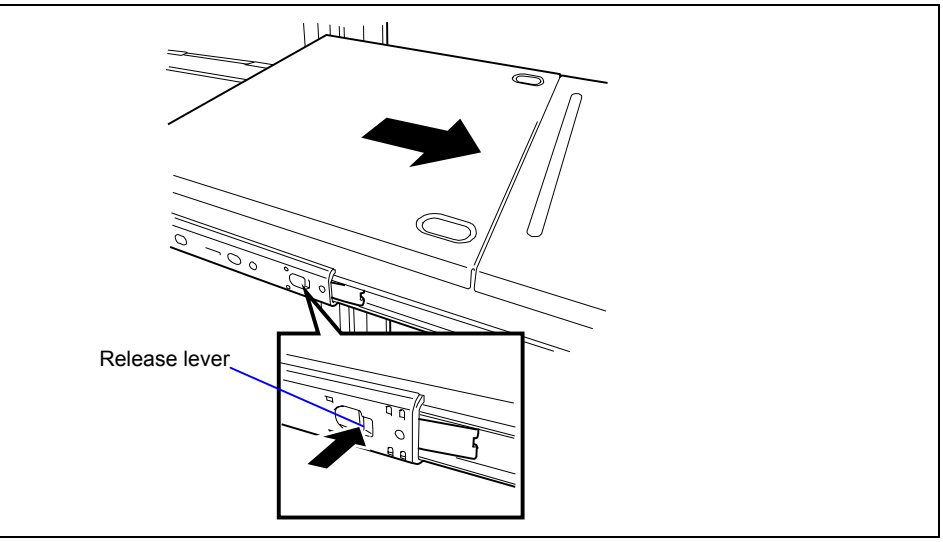


6. Pull out the server from the rack with the right and left release lever pressed to release the latch.

IMPORTANT:

- Pull out the server slowly holding the bottom of the server by at least two persons.
- Do not apply any load on the server pulled out from the rack. Doing so may cause personal injury if the server drops.

To remove some mechanical parts of the rack, see the installation procedure.



CONNECTING PERIPHERAL DEVICES

Connect peripheral devices to the server. The server is provided with connectors for wide variety of peripheral devices on its front and rear. The figure on the next page illustrates available peripheral devices for the server in the standard configuration and locations of the connectors for the devices.

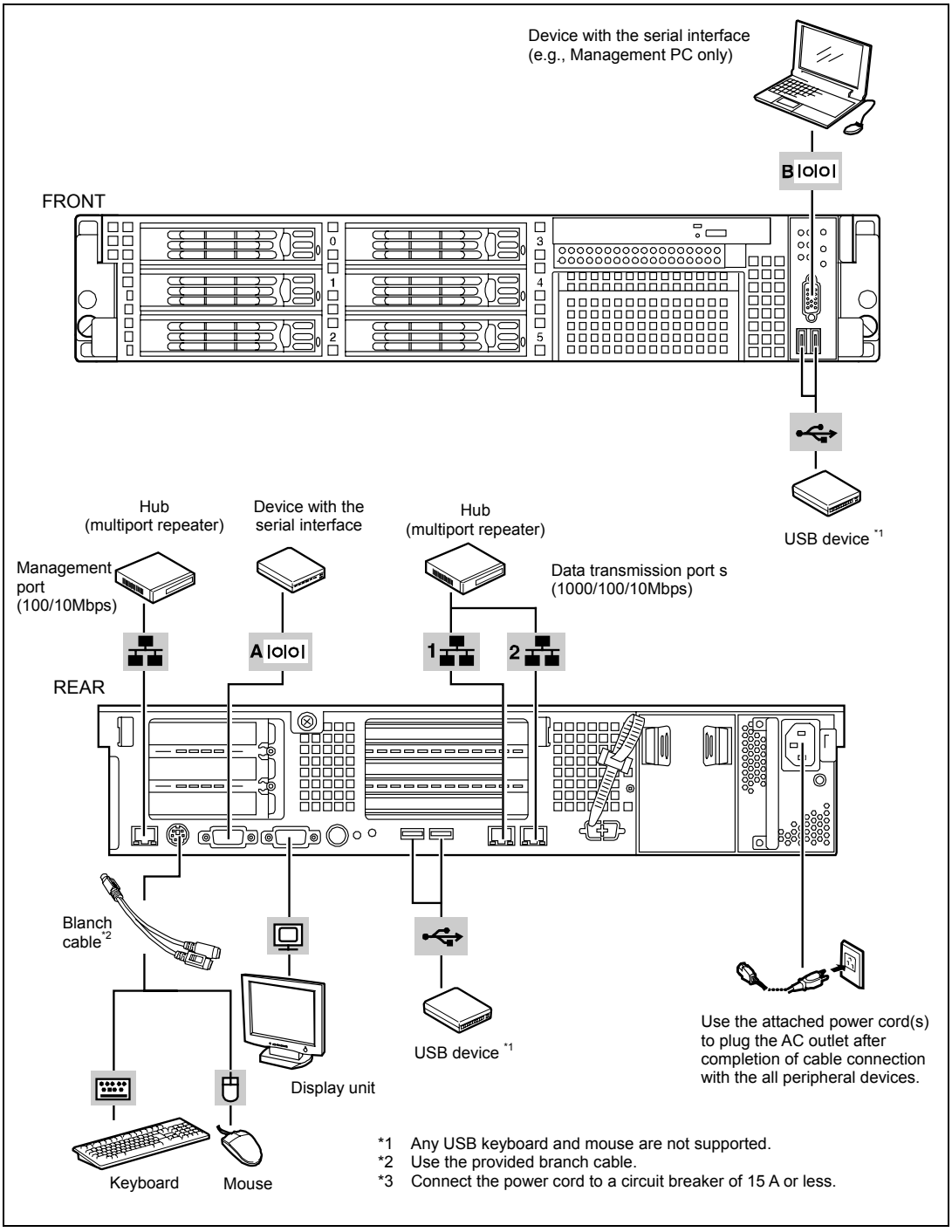
⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not connect any interface cable with the power cord of the NEC Express Server plugged to a power source.
- Do not use any unauthorized interface cable.

IMPORTANT:

- Power off the server and a peripheral device before connection. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.
- To connect a third-party peripheral device or interface cable to the server, consult with your service representative for availability of such a device or cable. Some third-party devices may not be used for the server.
- A leased line cannot be connected directly to the serial port connectors.
- Secure the power cord(s) and interface cables with a tie wrap.
- Form the cables in such a way that they will not come into contact with the door or the guide rails on the sides of the server.
- Form the power cord with a slight slack at the AC inlet of the server. This is to prevent the power cord from coming off when the server is pulled out from the rack.
- Do not apply any pressure to the plug of the power cord.



*1 Any USB keyboard and mouse are not supported.
*2 Use the provided branch cable.
*3 Connect the power cord to a circuit breaker of 15 A or less.

CONNECTING POWER CORD

Connect the provided power cord to the server.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not hold the power plug with a wet hand.
- Do not connect the ground wire to a gas pipe.

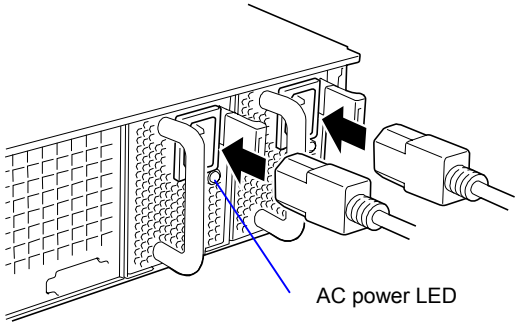
⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not plug the power cord in to an improper power source.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use the authorized power cord only.

1. Plug the provided power cord into the power receptacle on the rear of the server.
2. Plug the other end of the power cord into the wall outlet.

   The AC power LED on the power supply turns green and flashes.



IMPORTANT: Secure the power cord with an AC cord holder on the rear of the server.

To connect the power cord from the server to an uninterruptive power supply (UPS), use service outlets on the rear of the UPS. Refer to the manual that comes with the UPS.

When the power cord from the server to a UPS, change the BIOS setup of the server to link with power supply from the UPS.

To power on the server from the UPS (Uninterruptible Power Supply), select [Server] - [AC-LINK] - [Power On].

Change a parameter for "AC-LINK" under the Server menu of the BIOS SETUP utility. See Chapter 4 for details.

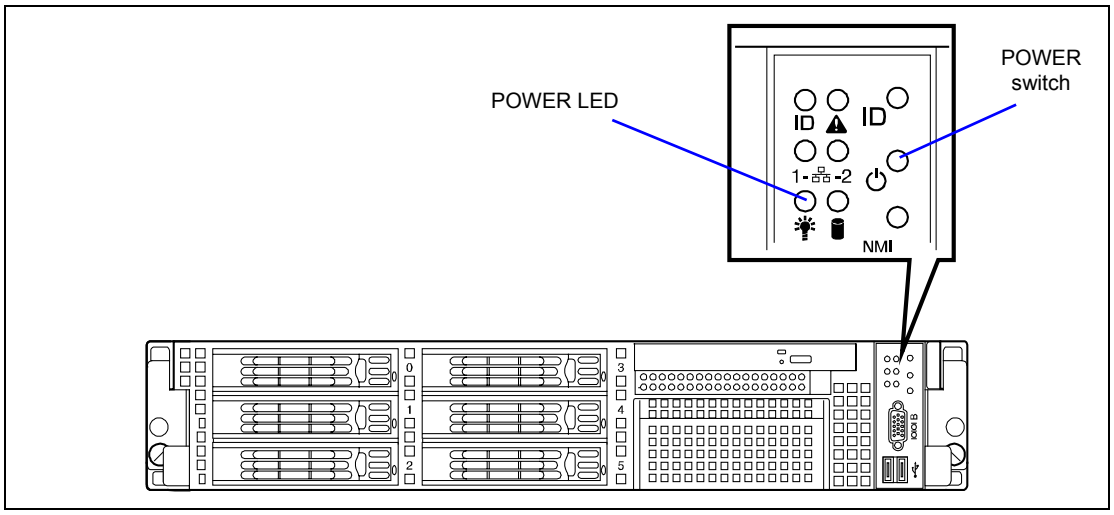
TURNING ON THE SERVER

Power on your system as follows.

1. Make sure all external devices, such as a video display, keyboard, and mouse (optional) have been connected, and the power cords are connected.
2. Power on the video display and any other external devices.

> **NOTE:** If the server power cord(s) is connected to a power control unit such as an UPS (Uninterruptible Power Supply), make sure that the power control unit is powered on.

3. Open the front bezel.
4. Press the POWER switch.



The POWER LED on the front of the server comes on.

After a few seconds your system begins the internal Power-On Self Test (POST). POST automatically checks the system board, CPU module, memory, keyboard, and most installed peripheral devices.

IMPORTANT:

- Always allow POST to complete before powering down your system.
- The server management logic on your system board monitors and logs system voltage changes. When powering down your system you may experience a 30-second delay from the time you press the push-button power on/off switch on the front panel and your system powering down. This is normal system operation and is required by the server management logic.

If you have problems powering on your system, see Chapter 8.

After you have successfully powered on your system, insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive, reboot the system and follow the screen prompts to run NEC EXPRESSBUILDER.

INSTALLING OPERATING SYSTEM

See Chapter 5 for installing the Microsoft Windows Server network operating system.

To install the other operating system listed above, contact your service representative.

> **IMPORTANT:** Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP." See the next chapter for detail.

INSTALLING UTILITIES

Install the utilities that come with the server. See Chapter 6 for details.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

> **NOTE:** An optional USB floppy disk drive is required.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk into the floppy disk drive.
6. Select [Save].

Chapter 4

Configuring Your Server

Configuration and setup utilities are used to change your system configuration. You can configure your system, as well as option boards you may add to your system, using the BIOS SETUP Utility. Several unique system parameters are configured using the BIOS SETUP, which is stored in the system FLASH memory.

The LSI Logic SoftwareRAID Setup Utility configures the disk array and logical drives connected to the onboard RAID controller.

If your system has been factory configured, the BIOS SETUP or LSI Logic SoftwareRAID Setup Utility do not need to be run unless you want to change the password or security features, add certain types of option boards or devices, upgrade your system board, or change the RAID configuration.

This chapter also provides information on several system configuration parameters that are set by jumpers on the system board. However, these parameters do not usually require change.

SYSTEM BIOS (SETUP)

The SETUP utility is used to change system configuration parameters. This utility is pre-installed in the flash memory of the server and ready to run.

The server is configured with the correct parameters using the SETUP utility and shipped in the best conditions. Thus, you don't need to use the SETUP utility in most cases. However, you might wish to use the SETUP utility in the cases described below.

IMPORTANT:

- The SETUP utility is intended for system administrator use only.
- The SETUP utility allows you to set a password. The server is provided with two levels of password: Supervisor and User. With the Supervisor password, you can view and change all system parameters of the SETUP utility. With the User password, system parameters available for viewing and changing are limited.
- Do not set any password before installing the OS.
- The server contains the latest version of the SETUP utility. Dialog boxes appear on your SETUP utility, thus, may differ from descriptions in this manual. If you find anything unclear, see the online help or ask your service representative.
- Use the Exit menu when exiting the SETUP utility. Exiting the utility with the POWER switch or reset operation causes the stored parameters to lose.

Starting SETUP Utility

Powering on the server starts POST (Power On Self-Test) and displays its check results. If the NEC logo is displayed, press **Esc**.

After a few seconds, the following message appears at bottom left on the screen.

```
Press <F2> to enter SETUP
```

Press **F2** to start the SETUP utility and display its Main menu.

If you have previously set a password with the SETUP utility, the password entry screen appears. Enter the password.

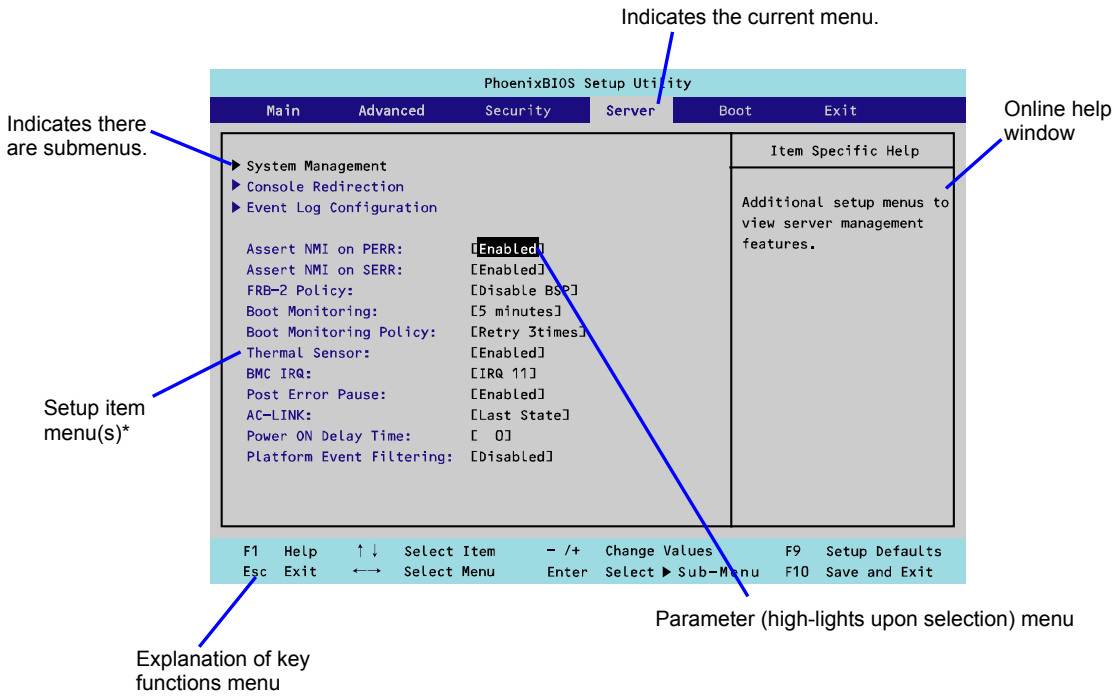
```
Enter password:[                ]
```

Up to three password entries will be accepted. If you fail to enter the password correctly for three consecutive times, the server halts. (You can no longer proceed.) Power off the server.

NOTE: The server is provided with two levels of password: Supervisor and User. With the Supervisor password, you can view and change all system parameters. With the User password, system parameters available for viewing and changing are limited.

Description on On-Screen Items and Key Usage

Use the following keyboard keys to work with the SETUP utility. (Key functions are also listed at the bottom of the screen.)


Indicates the current menu.
Indicates there are submenus.
Online help window
Setup item menu(s)*
Parameter (high-lights upon selection) menu
Explanation of key functions menu
PhoenixBIOS Setup Utility
Main Advanced Security Server Boot Exit
System Management
Console Redirection
Event Log Configuration
Assert NMI on PERR: [Enabled]
Assert NMI on SERR: [Enabled]
FRB-2 Policy: [Disable BSP]
Boot Monitoring: [5 minutes]
Boot Monitoring Policy: [Retry 3times]
Thermal Sensor: [Enabled]
BMC IRQ: [IRQ 11]
Post Error Pause: [Enabled]
AC-LINK: [Last State]
Power ON Delay Time: [0]
Platform Event Filtering: [Disabled]
Item Specific Help
Additional setup menus to view server management features.
F1 Help ↑ ↓ Select Item - /+ Change Values F9 Setup Defaults
Esc Exit ←→ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit

* The menus displayed in gray indicates the information only or unchangeable secured by BIOS password.

Cursor (↑, ↓):	Selects an item on the screen. The highlighted item is currently selected.
Cursor (←, →):	Selects the Main, Advanced, Security, Server, Boot, or Exit menu.
– and **+**:	Changes the value (parameter) of the selected item. When a submenu option (an option preceded by "➤") is selected, these keys are disabled.
Enter	Press **Enter** to select (determine) parameters.
Esc	Exit SETUP and return to the previous screen.
F9:	Sets the parameter of the currently displayed item back to the factory set parameter.
F10:	Save and exit the SETUP utility.

Menu and Parameter Descriptions

The SETUP utility has the following six major menus:

- Main
- Advanced
- Security
- Server
- Boot
- Exit

To set minute functions, select a submenu from the above menus. The following describes available functions and parameters, as well as the factory-set, for each menu.

Main

Option	Parameter	Description	Your Setting
System Time	HH:MM:SS	Set the system time.	
System Date	MM/DD/YYYY	Set the system date.	
Hard Disk Pre-Delay	[Disabled] 3 seconds 6 seconds 9 seconds 12 seconds 15 seconds 21 seconds 30 seconds	Allows slower spin-up drives to come ready.	
Primary IDE Master/ Primary IDE Slave Secondary IDE Master/ Secondary IDE Slave	Select submenu	Set the information on the device connected to each channel on the submenu. The settings of some items may be changed. However, leave the items as they are at the shipment.	
Processor Settings	Select submenu	Shows the processor settings submenu.	
Language	[English (US)] Français Deutsch Español Italiano	Select which language BIOS displays.	

[ ]: Factory-set

Primary IDE Master/Primary IDE Slave/Secondary IDE Master/Secondary IDE Slave

Correspondence between the menu items and devices:

- Primary IDE Master: DVD-ROM drive (standard)
- Primary IDE Slave: None
- Secondary IDE Master: None
- Secondary IDE Slave: None

Option	Parameter	Description	Your Setting
Type	None User [Auto] CD-ROM	Selects the type of device attached to the IDE or serial ATA channel. It is strongly recommended to keep the factory setting [Auto].	
* Parameters are configured automatically by BIOS.			
Multi-Sector Transfers*	Disabled 2 Sectors 4 Sectors 8 Sectors 16 Sectors	Specifies the number of sectors that are transferred per block during multiple sector transfers.	
LBA Mode Control*	Enabled Disabled	Enable/disable LBA instead of cylinder, head, sector, addressing.	
32 Bit I/O	[Disabled] Enabled	Enable/disable the 32-bit IDE data transfer mode.	
Transfer Mode*	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 FPIO 3/DMA1 FPIO 4/DMA2	Select the method for moving data to/from the drive.	
Ultra DMA*	Disabled Mode 0 Mode 1 Mode 2 Mode 3 Mode 4 Mode 5	Select the Ultra DMA mode used for moving data to/from the drive.	

[ ]: Factory-set

Processor Settings

Option	Parameter	Description	Your Setting
Processor Retest	[No] Yes	If yes, BIOS will clear historical processor status and retest the processor on the next boot.	
Processor Speed	nnn GHz	Displays clock speed for the processor. (View only)	
Processor 1 CPUID	Numeral Disabled	Displays CPU ID for processor, if present. "Disabled" indicates that the processor is defected. (View only)	
Processor 1 L2 Cache	nnn KB	Displays L2 cache size for processor.	
Processor 2 CPUID	Numeral Disabled	Displays CPU ID for processor, if present. "Disabled" indicates that the processor is defected. (View only)	
Processor 2 L2 Cache	nnn KB	Displays L2 cache size for processor.	
Execute Disable Bit	[Disabled] Enabled	Displayed only when the CPU supports Execute Disable Bit.	
Intel(R) Virtualization Tech.	[Disabled] Enabled	Enables or disables the Intel(R) virtualization technology.	

[ ]: Factory-set

Advanced

Option	Parameter	Description	Your Setting
Memory Configuration	–	Displays Memory Configuration submenu.	
PCI Configuration	–	Displays PCI Configuration submenu.	
Peripheral Configuration	–	Displays Peripheral Configuration submenu.	
Advanced Chipset Control	–	Displays Advanced Chipset Control submenu.	
Boot-time Diagnostic Screen	Enabled [Disabled]	When disabled, the BIOS will display the NEC logo during POST. Press **Esc** to switch to the POST execution screen.	
Reset Configuration Data	[No] Yes	Select "Yes" if you want to clear the system configuration data during the next boot. Automatically reset to "No" in the next boot.	
NumLock	On [Off]	Sets power on Numlock state.	
Memory/Processor Error	[Boot] Halt	If "Halt" is selected, the boot is stopped when POST error occurs.	

[ ]: Factory-set

Memory Configuration

Option	Parameter	Description	Your Setting
System Memory	nnn KB	Indicates the total capacity of the basic memory. (View only)	
Extended Memory	nnnnnnn KB	Indicates the total capacity of the extended memory. (View only)	
DIMM Group #1 - #6	Normal Disabled Not installed	Indicates the current memory status. "Normal" indicates the normal status, "Disabled" indicates a memory error, and "Not installed" indicates no DIMM installed (view only). DIMM Group #1: DIMM sockets #11 and #21 DIMM Group #2: DIMM sockets #31 and #41 DIMM Group #3: DIMM sockets #12 and #22 DIMM Group #4: DIMM sockets #32 and #42 DIMM Group #5: DIMM sockets #13 and #23 DIMM Group #6: DIMM sockets #33 and #43	
Memory Retest	Yes [No]	Causes BIOS to retest all memory on the next boot.	
Extended RAM Step	1MB 1KB Every location [Disabled]	"1MB" indicates that the memory test is done in the unit of 1MB. "1KB" indicates that the memory test is done in the unit of 1KB. "Every location" tests every memory location. "Disabled" indicates that only memory initialization is done. Only pressing **Space** is acceptable to suspend the test during the memory test.	
Memory RAS Feature	[Interleave] Mirror	Disables or enables memory mirroring feature. See "DIMM" in Chapter 9 for details.	
Sparing	[Disabled] Enabled	Disables or enables online spare memory feature. See "DIMM" in Chapter 9 for details.	

[ ]: Factory-set

PCI Configuration

– Onboard Video Controller submenu

Option	Parameter	Description	Your Setting
VGA Controller	Disabled [Enabled]	If Disabled, the BIOS will hold the embedded chip in reset.	
Onboard VGA Option ROM Scan	[Auto] Force	Allows selecting the onboard VGA controller or optional PCI VGA controller as the display device that will be active when the system boots. The “Force” option is selected to use the onboard VGA controller if the optional PCI VGA controller is installed in the system.	

[ ]: Factory-set

– Onboard LAN submenu

Option	Parameter	Description	Your Setting
LAN Controller	Disabled [Enabled]	If Disabled, the BIOS will hold the embedded chip in reset.	
LAN1 Option ROM Scan	Disabled [Enabled]	If Enabled, initialize device expansion ROM.	
LAN2 Option ROM Scan	Disabled [Enabled]	If Enabled, initialize device expansion ROM.	

[ ]: Factory-set

Option	Parameter	Description	Your Setting
PCI Slot 1B/2B/3B Option ROM	Disabled [Enabled]	Used to enable or disable an option ROM on a PCI board connected to the full-height riser card.	
PCI Slot 1C/2C/3C Option ROM	Disabled [Enabled]	Used to enable or disable an option ROM on a PCI board connected to the low-profile riser card.	

[ ]: Factory-set

Peripheral Configuration

IMPORTANT: Note that the interrupt and/or base I/O address are not overlapped with others. If the value set for the interrupt or base I/O address is used in another resource, the yellow asterisk (*) appears. Reset any item with the yellow asterisk properly.

Option	Parameter	Description	Your Setting
Serial Port A	Disabled [Enabled]	Selects whether serial port A is enabled or disabled.	
Base I/O address	[3F8] 2F8 3E8 2E8	Selects the base I/O address for serial port A.	
Interrupt	IRQ 3 [IRQ 4]	Selects the interrupt for a serial port A.	
Serial Port B	Disabled [Enabled]	Selects whether serial port B is enabled or disabled (display only).	
Base I/O address	3F8 [2F8] 3E8 2E8	Selects the base I/O address for serial port A.	
Interrupt	[IRQ 3] IRQ 4	Selects the interrupt for a serial port A.	
USB 2.0 Controller	Disabled [Enabled]	Selects the USB 2.0 controller is enabled or disabled.	
Parallel ATA	Disabled [Enabled]	Selects parallel ATA is enabled or disabled.	

[ ]: Factory-set

Advanced Chipset Control

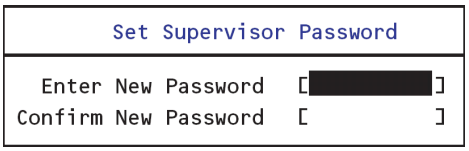
Option	Parameter	Description	Your Setting
Multimedia Timer	[Disabled] Enabled	Specify whether the system supports the multimedia timer feature.	
Intel(R) I/O AT	Disabled [Enabled]	Enables or disables the Intel(R) Acceleration technology.	
Wake On LAN/PME	Disabled [Enabled]	Specify whether the remote power-on function through embedded NIC and PCI devices installed in the system is enabled or disabled.	
Wake On Ring	[Disabled] Enabled	Specify whether the remote power-on function through a serial port is enabled or disabled.	
Wake On RTC Alarm	[Disabled] Enabled	Specify whether the remote power-on function by using RTC alarm feature is enabled or disabled.	

[ ]: Factory-set

Security

The Security menu appears if you move the cursor to the position of "Security."

Press **Enter** on "Set Supervisor Password" or "Set User Password," to display the following screen.



Enter the passwords on the dialog box. Passwords may have up to eight characters including alphanumerics and symbols.

IMPORTANT:

- User password can be set only when Supervisor password is already set.
- Set the passwords only after OS is installed.

See the table below for the items.

Option	Parameter	Description	Your Setting
Supervisor Password Is	Clear Set	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see Configuring Mother Board Jumpers in this Chapter).	
User Password Is	Clear Set	Status only, user cannot modify. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (see Configuring Mother Board Jumpers in this Chapter).	
Set Supervisor Password	Up to eight alphanumerics	When the <Enter> key is pressed, the user is prompted for a password; press ESC key to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to Configuring Mother Board Jumpers in this chapter).	

Option	Parameter	Description	Your Setting
Set User Password	Up to eight alphanumerics	Supervisor password controls access to the setup utility. When Enter is pressed, the user is prompted for a password; press **Esc** to abort. Once set, this can be disabled by setting it to a null string, or by clearing password jumper on system board (refer to Configuring Mother Board Jumpers in this chapter).	
Password on boot	[Disabled] Enabled	Disables or enables password entry on boot.	
Fixed disk boot sector	[Normal] Write Protect	Will write protect the boot sector of the hard drive to prevent viruses from corrupting the drive under DOS if set to write protect.	
Power Switch Inhibit	[Disabled] Enabled	Enables or disables the POWER switch. If "Enabled" is selected, power-off with the POWER switch becomes unavailable after OS boot-up. (Forced shut down feature is always acceptable to the server. Forced shut down is a feature to shut down by pressing the POWER switch for at least four seconds.)	

[ ]: Factory-set

Server

Option	Parameter	Description	Your Setting
System Management	–	System Management submenu is displayed.	
Console Redirection	–	Console Redirection submenu is displayed.	
Event Log Configuration	–	Event Log Configuration submenu is displayed.	
Assert NMI on PERR	Disabled [Enabled]	Specify whether to support PCI PERR or not.	
Assert NMI on SERR	Disabled [Enabled]	Specify whether to support PCI SERR or not.	
FRB-2 Policy	Disable FRB2 Timer Disable BSP Do Not Disable BSP [Retry 3 Times]	Set the FRB level 2 timer.	
Boot Monitoring	[Disabled] 5 Minutes 10 minutes 15 minutes 20 minutes 25 minutes 30 minutes 35 minutes 40 minutes 45 minutes 50 minutes 55 minutes 60 minutes	Specify whether to enable or disable the boot monitoring function on booting, or select the time limit for timeout. To use this function, install NEC ESMPRO Agent. Set this item to "Disabled" if the system is booted from OS without installation of NEC ESMPRO Agent.	
Boot Monitoring Policy	[Retry 3 Times] Retry Service Boot Always Reset	Specify the processing at the occurrence of timeout during boot monitoring. If [Retry 3 times] is selected, the system is reset after the occurrence of timeout and OS boot is retried up to three times. If [Retry Service Boot] is selected, the system is reset after the occurrence of timeout and OS boot is retried up to three times. Then the boot is tried from the service partition for three times. The failure in the third boot causes the system to stop booting. If [Always Reset] is selected, the system is reset after the occurrence of timeout and OS boot is retried repeatedly. * If no service partition exists in the system, OS boot is retried repeatedly from the system partition.	

Option	Parameter	Description	Your Setting
Thermal Sensor	Disabled [Enabled]	Specify whether to enable or disable the thermal sensor monitoring function. If a thermal error is detected with this item being set to "Enabled", the system stops at the end of POST.	
BMC IRQ	Disabled [IRQ 11]	Determines routing of the BMC interrupt.	
Post Error Pause	Disabled [Enabled]	Specify whether to stop the POST once at the end of POST if an error occurs during the POST.	
AC-LINK	Stay Off [Last State] Power On	Specify the state of power when the AC power to the server is turn off once and then on.	
Power ON Delay Time (Sec)	[0] - 255	Specify the power on delay time within the range between 0 and 255 seconds. The time specified is valid when "Power On" or "Last State" is specified for AC LINK.	
Platform Event Filtering	Disabled [Enabled]	Specify whether to enable or disable the platform event filtering (PEF) feature.	

[ ]: Factory-set

IMPORTANT: To power on the server from the UPS (Uninterruptible Power Supply), select [Server] - [AC LINK] - [Power On].

The table below shows the operation when the AC power to the server is turn off once and then on again, depending on the setting of "AC LINK."

System status before AC power off	Setting of AC LINK		
	Stay Off	Last State	Power On
Operating	Off	On	On
Aborting (DC power being off also)	Off	Off	On
Forced shutdown	Off	Off	On

* Press the power switch continuously for four seconds or longer. This forcibly turns off the power.

System Management Submenu

Option	Parameter	Description	Your Setting
BIOS Version	–	Displays the current BIOS version. (View only)	
Board Part Number	–	Displays the part number of mother board. (View only)	
Board Serial Number	–	Displays the serial number of mother board. (View only)	
System Part Number	–	Displays the part number of the system. (View only)	
System Serial Number	–	Displays the serial number of the system. (View only)	
Chassis Part Number	–	Displays the part number of the chassis. (View only)	
Chassis Serial Number	–	Displays the serial number of the chassis. (View only)	
Onboard LAN1 MAC Address	–	Displays the MAC address of the onboard LAN port 1. (View only)	
Onboard LAN2 MAC Address	–	Displays the MAC address of the onboard LAN port 2. (View only)	
Management LAN MAC Address	–	Displays the MAC address of the management LAN port. (View only)	
BMC Device ID	–	Displays BMC device ID. (View only)	
BMC Device Revision	–	Displays BMC device revision. (View only)	
BMC Firmware Revision	–	Displays BMC firmware revision. (View only)	
SDR Revision	–	Displays revision of the sensor data record.	
PIA Revision	–	Displays revision of the platform information area. (View only)	

[ ]: Factory-set

Console Redirection Submenu

Option	Parameter	Description	Your Setting
BIOS Redirection Port	[Disabled] Serial Port A Serial Port B	Specify the address/interrupt of the serial port to which a remote console is connected.	
ACPI Redirection Port	[Disabled] Serial Port A Serial Port B	Specify the serial port to which an ACPI console is connected.	
Baud Rate	9600 [19.2K] 38.4K 57.6K 115.2K	Specify the baud rate used for the interface with successive remote consoles.	
Flow Control	None Xon/Xoff [CTS/RTS] CTS/RTS+CD	Specify the flow control method.	
Console Type	PC ANSI [VT100+] VT-UTF8	Specify the type of remote console.	
Remote Console Reset	[Disabled] Enabled	Specify whether to enable or disable resetting by Escape command (Esc R) sent from the remote console.	

[ ]: Factory-set

Event Log Configuration Submenu

Option	Parameter	Description	Your Setting
Clear All Event Logs	–	Press **Enter** and select "Yes" to clear the system event log.	

Boot

If you move the cursor to the position of "Boot," the Boot menu appears, which is used to set the boot priority.

Indication	Device
USB CDROM	USB CD-ROM drive
IDE CD	ATAPI CD-ROM (including DVD-ROM drive)
USB FDC	USB floppy disk drive
USB KEY	USB flash memory device
IDE HDD	IDE hard disk drives
PCI SCSI	Internal hard disk drives installed in your system (“Software RAID” is displayed in the RAID configuration.)
PCI DEV	**IBA GE Slot xxxx** Onboard LAN. LAN1: Slot 0C00, LAN2: Slot 0C01 **Other indication** Optional PCI board connected to the riser module.

1. When BIOS detects a bootable device, it displays the information on the device in the relevant indication.

   To boot the server from a desired device, the device must be registered as a boot device. (Up to eight boot devices can be registered.)

2. Pressing **X** after selecting a device allows the selected device to be registered as a boot device or deleted from the registration.

   With eight boot devices being registered, any other device cannot be registered as a boot device even if you press **X**. To register a device as a boot device newly, first delete the registration of a device registered as a boot device but not booted any more.

   Pressing **Shift** + **1** after selecting a device allows the selected device to be made enabled/disabled.

3. You can change the boot priority (first to eighth) of each device by using ↑, ↓, **+** and/or **–**.

   To change the priority of a device, move the cursor to the device by using the ↑ or ↓**,** and press **+** or **–**.

Exit

The options on the menu are described below.

Exit Saving Changes

Exit after writing all modified BIOS SETUP item values to CMOS.

Exit Discarding Changes

Exit leaving CMOS unmodified. User is prompted if any of the setup fields ware modified.

Load Setup Defaults

Load default values for all BIOS SETUP items.

Load Custom Defaults

Load custom defaults for BIOS SETUP options.

Save Custom Defaults

Saves the current values as custom defaults. The “Load Custom Defaults” menu appears on the screen after saving the custom default values.

Discard Changes

Read the previous values of the all BIOS SETUP items from CMOS.

Save Changes

Write all BIOS SETUP item values to CMOS.

RAID CONFIGURATION

This section describes how to configure the internal hard disk drives as the disk array drive by using the onboard RAID controller. Refer to the manual of the optional disk array controller for how to configure the hard disk drives by using the optional disk array controller.

To use the hard disk drives installed in the disk expansion unit in a disk array, the optional disk array controller is necessary. Refer to the manual of the optional disk array controller or disk expansion unit for details.

Onboard RAID Features

You can configure a disk array (RAID0, RAID1, or RAID10) by using the onboard RAID controller of the server.

- RAID0 (striping)

  Stores data on two, three, or four hard disk drives by dividing it (striping). All the hard disk drives can be accessed at the same time. This improves disk access performance compared with using a single hard disk drive.

  IMPORTANT:
  - RAID0 does not have data redundancy. When a hard disk drive failure occurs, data cannot be restored.
  - Logical capacity of the array becomes a multiple of the connected hard disk drive.

- RAID1 (mirroring)

  Stores the data being saved to one hard disk dive to another hard disk drive. This method is called "mirroring." When storing data onto one hard disk drive, the same data is simultaneously stored onto another hard disk drive. When a hard disk drive becomes faulty, the one with the same data can be used. This provides operation without the system going down.

  IMPORTANT:
  - RAID1 reads or writes data to/from the several hard disk drives at the same time. The disk access performance is lower than the single disk.
  - Logical capacity of the array is equal to one hard disk drive connected.

- RAID10 (spanning of RAID1)

  RAID10 is a RAID level combined with RAID0 and RAID1.

  Stores data on hard disk drives by dividing it (striping). Then, each striped data is written onto hard disk drives in mirroring mode. Owing to this feature, high disk access performance of RAID0 and, in addition, high reliability of RAID1 can be achieved.

IMPORTANT: Logical capacity of the array is equal to one hard disk drive connected.

Installing the Hard Disk Drives

Install the two or more SAS hard disk drives to your server. See Chapter 9 for detail.

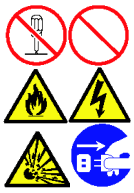
IMPORTANT: Use two hard disk drives of the same revolution. In addition, use two hard disk drives of the same capacity if you are going to configure RAID1.

Enabling RAID Feature

To configure a hard disk drive as RAID drive, change setting of RAID configuration jumper switch on mother board.

NOTE: The factory-set value is to use the hard disk drive as a single disk drive.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

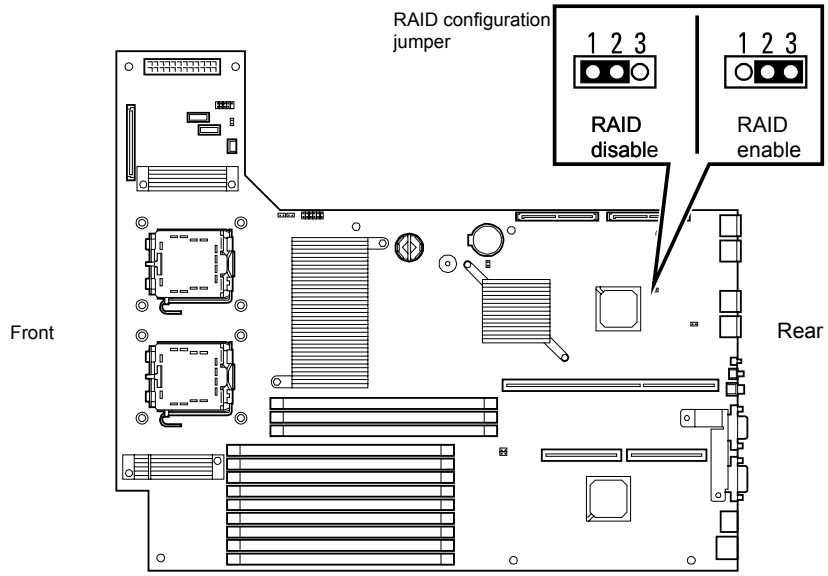
- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Make sure to complete board installation.
- Do not install the server on a rack with leaving covers removed.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

1. See the section "Preparing for Installation and Removal" as described in Chapter 9 of this guide to prepare.
2. Remove the logic cover (see Chapter 9).
3. Locate the position of the RAID configuration jumper on the mother board as shown below.

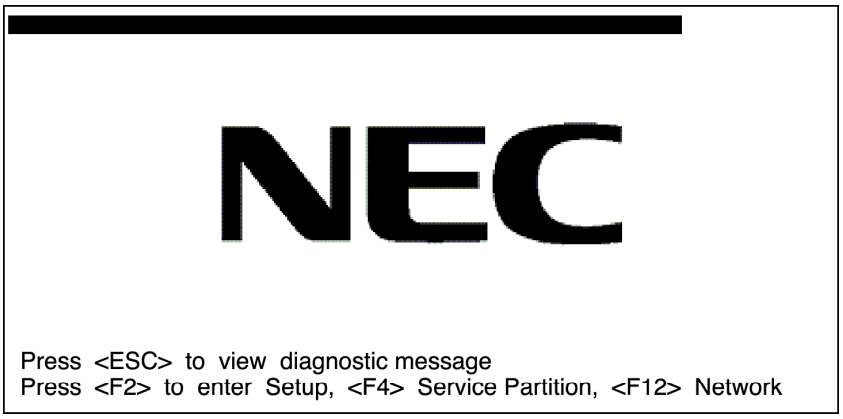


4. Remove the jumper from position 1 – 1 on jumper block.
5. Reinstall the jumper on position 2 – 3 on jumper block.
6. Reinstall the server removed in Step 2.
7. Plug the power cord to your server and turn on the server.

Running LSI Logic Software RAID Setup Utility

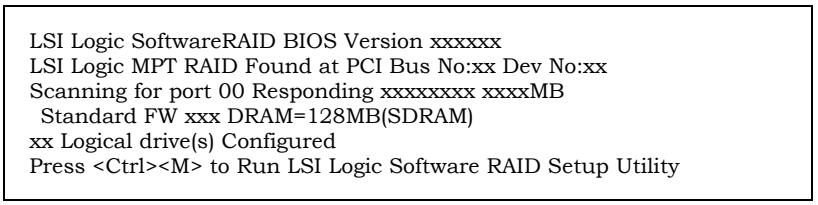
1. When the following screen appears after you have powered on the server, press **Esc**.

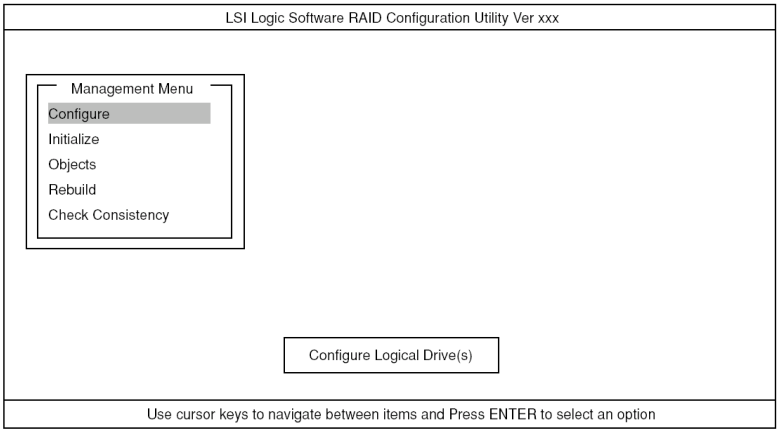
The POST screen appears.



2. Check the description as shown below on the POST screen, then press **Ctrl** + **M**.

LSI Logic Software RAID Setup Utility starts.


LSI Logic SoftwareRAID BIOS Version xxxxxx
LSI Logic MPT RAID Found at PCI Bus No:xx Dev No:xx
Scanning for port 00 Responding xxxxxxxx xxxxMB
Standard FW xxx DRAM=128MB(SDRAM)
xx Logical drive(s) Configured
Press <Ctrl><M> to Run LSI Logic Software RAID Setup Utility



LSI Logic Software RAID Configuration Utility TOP Menu (Management Menu)

To quit the utility, press **Esc** in the TOP menu of LSI Logic Software RAID Setup Utility.

When a confirmation message appears, select [Yes].

When the above message appears, press **Ctrl** + **Alt** + **Delete**.

The server is rebooted.

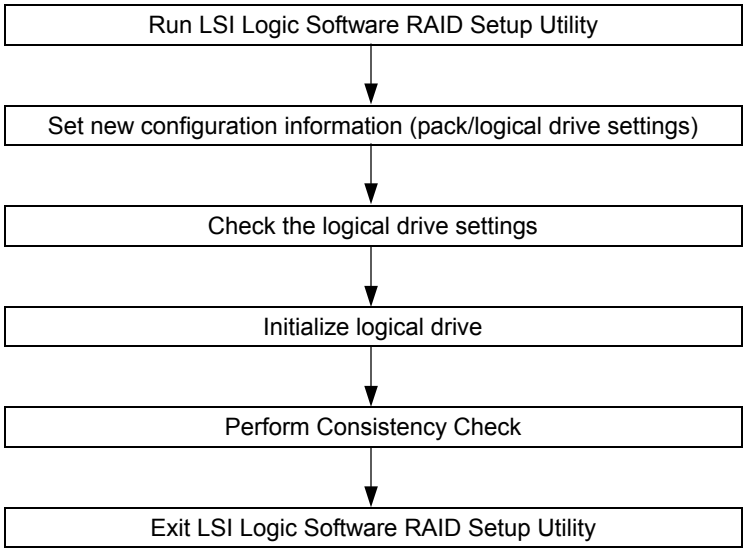
Menu Tree

+: Selection/execution parameter ✶: Setting parameter. •: Information display
>: Can be set (modified) after creation of logical drive

Menu	Description
+Configure	Performs Configuration settings
+Easy Configuration	Set configuration (Using fixed value)
+New Configuration	Set new configuration
+View/Add Configuration	Additional setting / viewing configuration
+Clear Configuration	Clear configuration
+Select Boot Drive	Chose Bootable Logical Drive
+Initialize	Initialize logical drive
+Objects	Various settings
+Adapter	Set disk array controller
+Sel. Adapter	Clear configuration
✶Rebuild Rate	30
✶Chk Const Rate	30
✶FGI Rate	30
✶BGI Rate	30
✶Disk WC	Off
✶Read Ahead	On
✶Bios State	Enable
✶Stop on Error	No
✶Fast Init	Enable
✶Auto Rebuild	On
✶Auto Resume	Enable
✶Disk Coercion	1GB
✶Factoty Default	
+Logical Drive	Logical drive operation
+Logical Drives	Select logical drive (when multiple logical drives exist)
+Initialize	Initialize logical drive
+Check Consistency	Check logical drive redundancy
+View/Update Parameters	Display logical drive information
• RAID	Display RAID level
• SIZE	Display logical drive capacity
• Stripe SIZE	Display stripe size
• #Stripes	Display the number of hard disk drives in logical drive
• State	Display logical drive status
• Spans	
• Disk WC	Off: Write through On: Write back
• Read Ahead	
+Physical Drive	Physical drive operation
+Physical Drive Selection Menu	Select physical drive
+Make HotSpare	Set as hot-spare disk for auto rebuilding
+Force Online	Make a disk online
+Force Offline	Make a disk offline
+Drive Properties	Display hard disk drive information
• Device Type	Hard disk drive type
• Capacity	Hard disk drive capacity
• Product ID	Hard disk drive model
• Revision No.	Hard disk drive revision
+Rebuild	Perform rebuilding
+Check Consistency	Perform logical drive redundancy check

Operating Procedures for Setup Utility

Creating/Adding Configuration


Run LSI Logic Software RAID Setup Utility
Set new configuration information (pack/logical drive settings)
Check the logical drive settings
Initialize logical drive
Perform Consistency Check
Exit LSI Logic Software RAID Setup Utility

3. Run LSI Logic Software RAID Setup Utility.

Select "Configure" → "New Configuration" from the TOP menu (Management Menu).

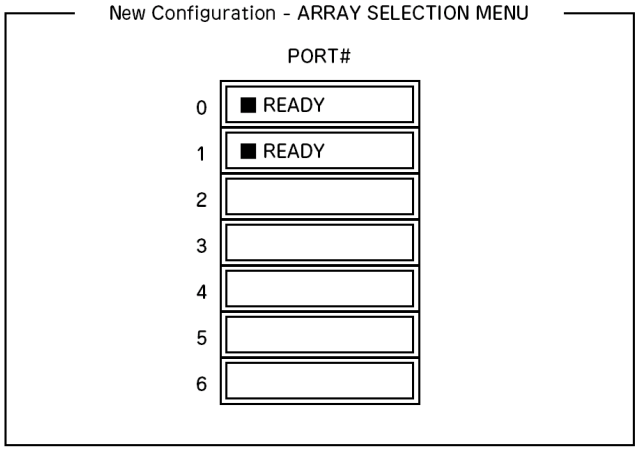
Select "View/add Configuration" to add configuration.

IMPORTANT:

- Creating a configuration using "New Configuration" menu clears the existing configuration information. To add configuration information to the existing configuration, select "View/add Configuration."
- You cannot create Spanning of RAID1 or set the logical drive capacity on "Easy Configuration" menu.
  Use "New Configuration" or "View/Add Configuration" instead.

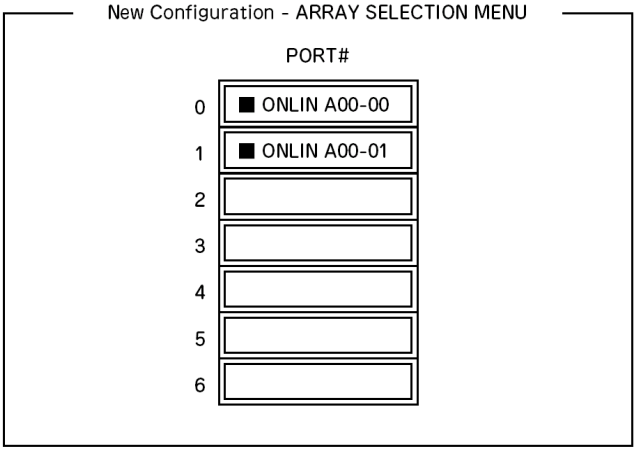
4. When a confirmation message (Proceed?) is displayed, select "Yes."

The SCAN DEVICE starts (scanning information is displayed at the bottom of the screen). Upon completion of SCAN DEVICE, the "New Configuration - ARRAY SELECTION MENU" screen appears.



5. Move the cursor onto the hard disk drive to be packed by using cursor key and then press **Space** to select the hard disk drive.

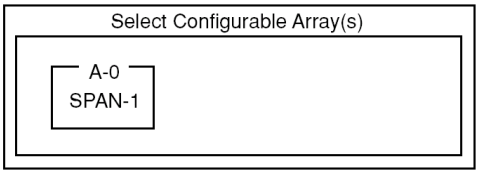
The display for the selected hard disk drive changes from READY to ONLINE.



6. Press **F10** to set "Select Configurable Array(s)".

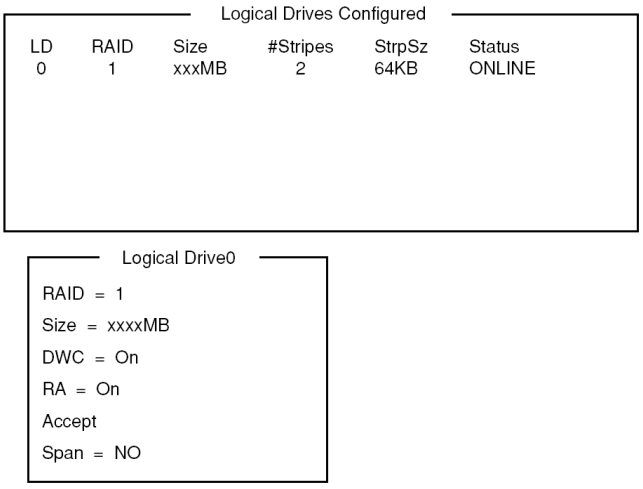
7. Press **Space**.

SPAN-1 is set.



8. Press **F10** to create logical drive.

The "Logical Drives Configure" screen appears. (The figure below shows an example of RAID1 configured with two hard disk drives.)



9. Select "RAID," "Size", "DWC", "RA", or "Span" by using cursor keys. Then press Enter to fix the selection and set each value.

(1) "RAID": Sets RAID level.

Parameter	**Remarks**
0	RAID0
1	RAID1
5	RAID5 (option)
10	Spanning of RAID1

The selectable RAID level varies depending on the number of hard disk drives that configure a pack.

(2) "Size": Sets logical drive size.

Up to 40 logical drives can be created per disk array controller.

(3) "DWC": Sets parameter for Disk Write Cache.

Parameter	Remarks
Off	Write through
On	Write back

(4) "RA": Sets parameter for Read Ahead.

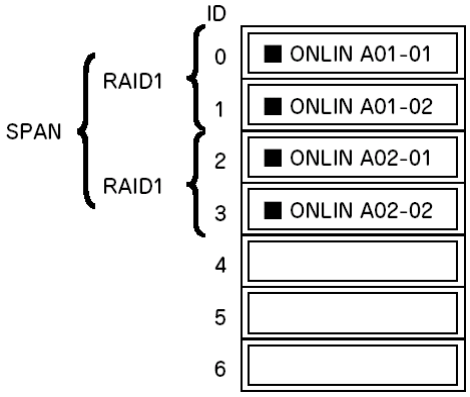
Parameter	Remarks
Off	Does not perform read ahead.
On	Performs read ahead.

(5) "Span: Sets Span.

Parameter	Remarks
SPAN=NO	Does not set span.
SPAN=YES	Sets span.

When performing SPAN, create two or more sets of the same pack at pack creation, as shown in the figure below.

SPANNING of RAID1



1. When all settings are completed, select "Accept" and then press **Enter** to create logical drive.

   The created logical drive is displayed in the "Logical Drive Configured" screen.

2. After creating logical drive, press **Esc** to close the screen.

   Go back to the "Save Configuration?" screen and then select "Yes" to save the configuration.

3. When the confirmation message shows that the configuration has been saved, press **Esc** to return to the TOP menu screen.

4. On the TOP menu screen, select "Objects" → "Logical Drive" → "View/Update Parameters" to check logical drive information.

5. Select "Initialize" in the TOP menu screen.

6. When the "Logical Drives" screen appears, move the cursor to the logical drive to be initialized, and press **Space**.

   The logical drive is selected.

7. After selecting logical drive, press **F10** to start initialization.

   A confirmation screen for execution appears. Select "Yes" to start initialization.

   When the progress bar in the "Initialize Logical Drive Progress" screen indicates 100%, initialization is completed.

8. Execute Check Consistency on the logical drive that has been initialized.

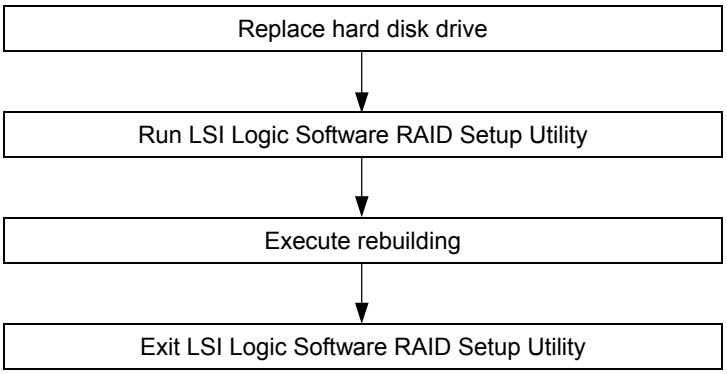
   See "Check Consistency" for details.

9. Press **Esc** to return to the TOP menu and exit from LSI Logic Software RAID Setup Utility.

IMPORTANT:

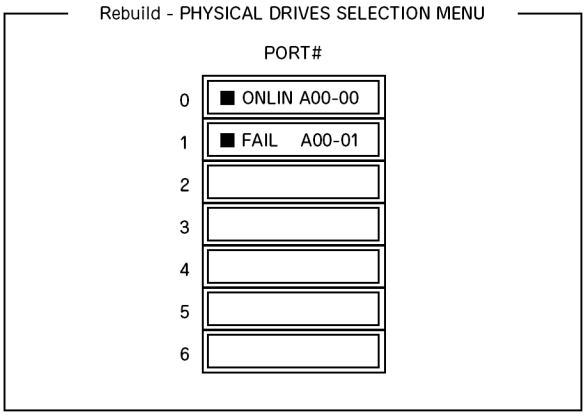
- Be sure to execute Check Consistency after creating configuration.
- Check Consistency has two modes: "check and recover" and "check only".

Manual Rebuild


Replace hard disk drive
Run LSI Logic Software RAID Setup Utility
Execute rebuilding
Exit LSI Logic Software RAID Setup Utility

1. Replace a hard disk drive and turn on the server.
2. Run LSI Logic Software RAID Setup Utility.
3. Select "Rebuild" from the TOP menu.

   The "Rebuild – PHYSICAL DRIVES SELECTION MENU" screen appears.



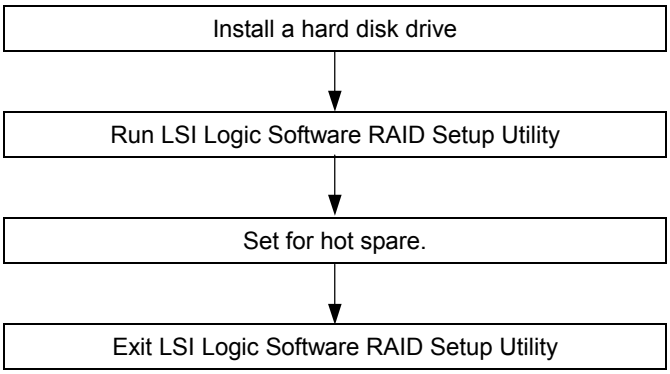
4. Move the cursor onto the hard disk drive displaying "FAIL," and then press **Space** to select it.

   Multiple hard disk drives can be selected (simultaneous rebuilding.)
5. The "FAIL" indication for the hard disk drive selected starts blinking.
6. When hard disk drive has been selected, press **F10** to start rebuilding.
7. When confirmation screen for execution appears. Select "Yes".

   The rebuild process starts.

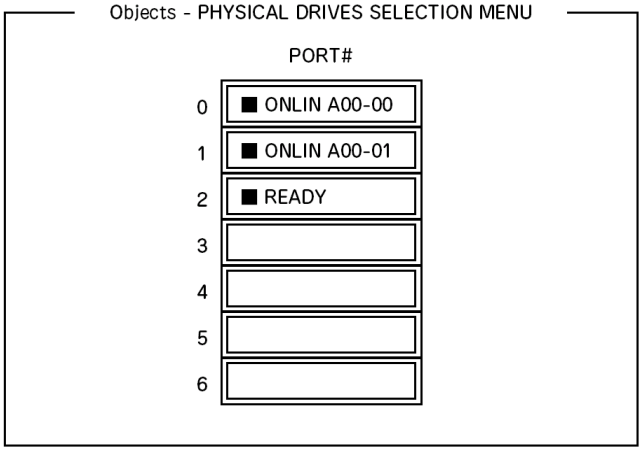
   When the progress bar in the "Rebuild Physical Drives in Progress" screen indicates 100%, rebuilding is completed.
8. Press **Esc** to return to the TOP menu and exit LSI Logic Software RAID Setup Utility.

Setting Hot Spare


Install a hard disk drive
Run LSI Logic Software RAID Setup Utility
Set for hot spare.
Exit LSI Logic Software RAID Setup Utility

1. Install a hard disk drive to be used as hot spare, and then turn on the server.
2. Run LSI Logic Software RAID Setup Utility.
3. Select "Objects" → "Physical Drive" from the TOP menu.

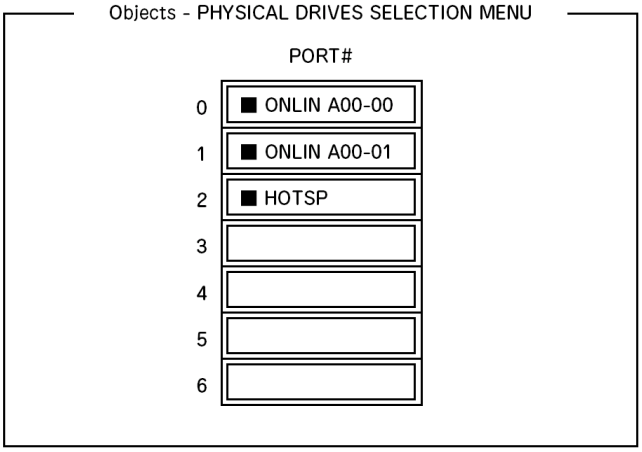
   The "Objects - PHYSICAL DRIVE SELECTION MENU" screen appears.



4. Move the cursor onto the hard disk drive to be used as hot spare and press **Enter**.
5. The "Port #X" screen appears. Select "Make HotSpare."
6. A confirmation screen appears. Select "Yes."

   The hard disk drive indication is changed to "HOTSP."

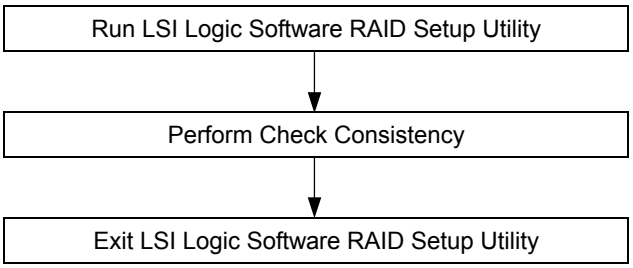
7. Press **Esc** to return to the TOP menu and exit LSI Logic Software RAID Setup Utility.



IMPORTANT:

- Select "Objects" → "Physical Drive" → "Port #X" → "Force Offline" to cancel the hot spare setting.
- When two or more hard disk drives (of the same capacity) are assigned as hot spare, rebuilding is performed in order starting from the one with the smaller CH number/ID number.

Check Consistency



1. Run LSI Logic Software RAID Setup Utility.
2. Select "Check Consistency" from the TOP menu.

   The "Logical Drives" screen appears.
3. Move the cursor onto the logical drive to be checked, and press **Space** to select it.
4. When logical drive has been selected, press **F10** to start consistency check.
5. A confirmation screen for execution appears. Select "Yes".

   The consistency check starts.

   When the progress bar in the "Check Consistency Progress" screen indicates 100%, the consistency check is completed.
6. Press **Esc** to return to the TOP menu and exit LSI Logic Software RAID Setup Utility.

IMPORTANT:

- Be sure to execute Check Consistency after creating configuration.
- Check Consistency has two modes: "check and recover" and "check only".

Others

- Clear Configuration

  Clears configuration information. Select "Configure" → "Clear Configuration" from the TOP menu. Executing "Clear Configuration" clears all configuration information on the disk array controller and hard disk drives. The configuration information on all channels of the disk array controller is also cleared.

  NOTES:

  - When configuration information on the disk array controller and that on the hard disk drive do not match (excluding at replacement of faulty disk array controller), configuration mail fail if you select the configuration information on the disk array controller. In this case, execute "Clear Configuration" to create configuration again.
  - LSI Logic Software RAID Setup Utility cannot delete each logical drive. Use MegaRAID Storage Manager instead.

- Force Online

  Puts a hard disk drive being in the FAIL status online.

  Select "Objects" → "Physical Drive" → (select hard disk drive) → "Force Online" from the TOP menu.

- Rebuild Rate

  Sets the Rebuild Rate.

  Select "Objects" → "Adapter" → "Sel. Adapter" → "Rebuild Rate" from the TOP menu.

  Available value is between 0% and 100%. Default value (recommended) is 30%.

- Hard disk drive information

  Checks hard disk drive information.

  Select "Objects" → "Physical Drive" → (select hard disk drive) → "Drive Properties" from the TOP menu.

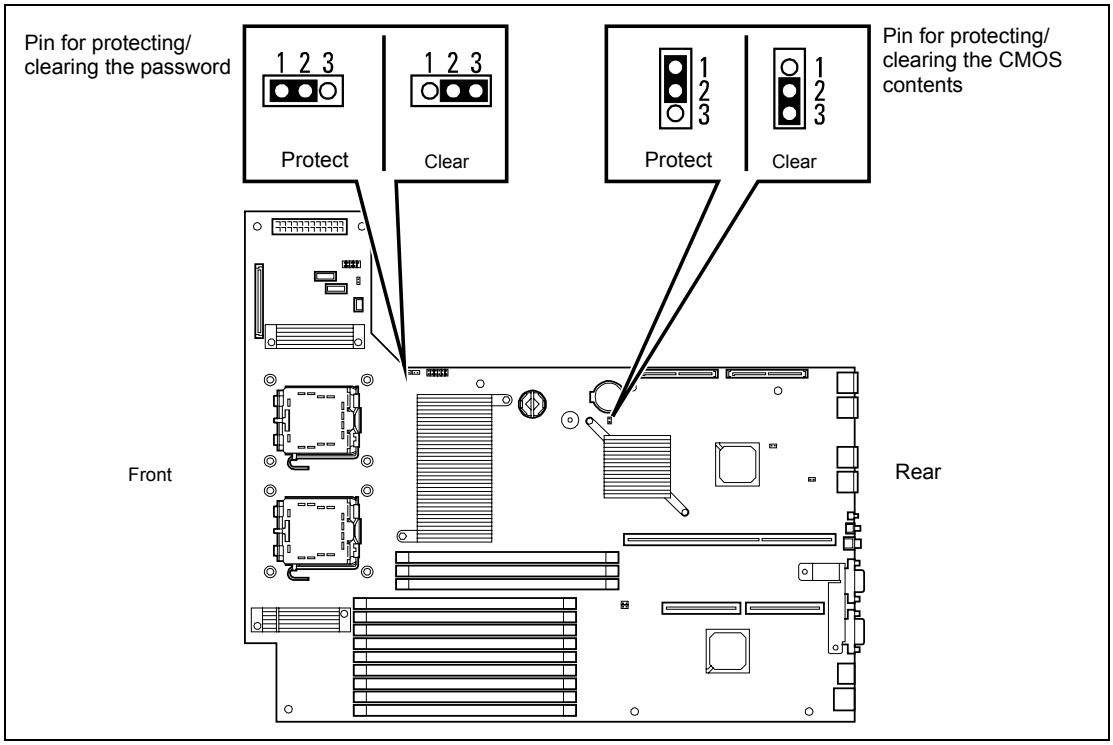
CONFIGURING MOTHER BOARD JUMPERS

With the pre-installed SETUP utility, you can set desired passwords to protect the data stored in the server against access from unauthorized users. When you forget the passwords, however, you may want clear them. The following describes how to clear these passwords. You can also use the following procedure to clear the CMOS data in the server.

IMPORTANT:

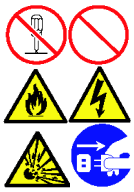
- Clearing the CMOS data resumes the factory-set configuration data.
- After clearing CMOS, you must run the BIOS SETUP utility and execute the following menus to reconfigure your mother board.
  – Load Setup Defaults in the Exit menu
  – Memory Retest of Memory Configuration in the Advanced menu
  – Processor Retest of Processor Settings in the Main menu
- Refer to "RAID Configuration" described earlier in this chapter for RAID configuration jumper setting.
- Do not change any other switch settings. Any change may cause the server to fail or malfunction.

To clear passwords or the CMOS data, use the jumper switch on the mother board of the server. The following figure illustrates the jumper switch location.



The following describe the clearing procedure.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Do not connect the ground line to a gas pipe.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Never attempt to lift the server only by yourself.
- Make sure to complete board installation.
- Do not install the server on a rack with leaving covers removed.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

1. See the section "Preparing for Installation and Removal" as described in Chapter 9 of this guide to prepare.
2. Remove the logic cover (see Chapter 9).
3. Locate the position of the jumpers on the mother board you are changing.
4. For clearing the BIOS password, remove the jumper strap on the BIOS password clear jumper. For Clearing the CMOS, move the jumper strap to the CMOS clear position.

   Refer to the previous illustration to find the location of the jumper.
5. Wait for a while (about 5 seconds), and then reinstall the jumper block to the default position.
6. Reinstall the server removed in Step 2.
7. Plug the power cord to your server and turn on the server.
8. Press **F2** at the prompt to run the BIOS SETUP utility, and select "Load Setup Defaults" at the Exit menu.

Chapter 5

Installing the Operating System with Express Setup

This section describes information on using Express Setup to install and configure the following operating systems to server.

- Microsoft® Windows Server® 2003 R2 Standard Edition / Microsoft® Windows Server® 2003 R2 Enterprise Edition
- Microsoft® Windows Server® 2003 Standard Edition / Microsoft® Windows Server® 2003 Enterprise Edition

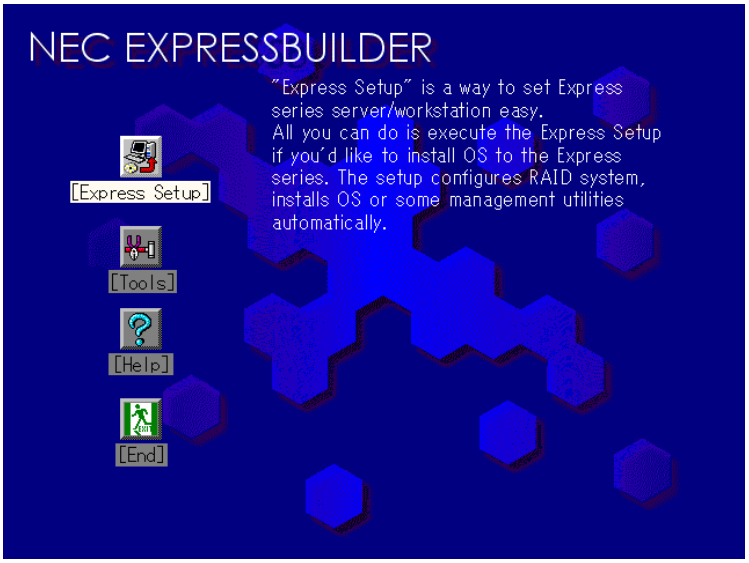
To use the server with the other operating systems described in this section, contact your service representative.

> **IMPORTANT:** Before installing the operating system, adjust the system date and time by using the BIOS setup utility "SETUP." See Chapter 4 for detail.

ABOUT EXPRESS SETUP

"Express Setup" helps you to install the Windows Operating System. The setup automatically configures the RAID system and installs the Operating System and some management software.

IMPROTANT: Executing the Express Setup erases all data on the hard disk drive.


NEC EXPRESSBUILDER
"Express Setup" is a way to set Express series server/workstation easy.
All you can do is execute the Express Setup if you'd like to install OS to the Express series. The setup configures RAID system, installs OS or some management utilities automatically.
[Express Setup]
[Tools]
[Help]
[End]

You can also use "Configuration diskette Creator" at "Express Setup" in order to save or backup parameters for installation. The Configuration disk is able to have some parameters files that include the configuration information for the server setup. If you want to set up the server as before, execute the Express Setup with the parameters file you have saved that time.

NOTES:

- The parameters file is not mandatory to set up the system.
- If you want to create a parameters file, have a blank floppy disk (MS-DOS 1.44MB format) ready.
- If you want to use the drivers located on the "OEM-Disk for Mass Storage Device" that ships with optional boards, a parameters file is mandatory.
- You can create a parameters file in advance using "Configuration Diskette Creator" included in NEC EXPRESSBUILDER.
- "Configuration Diskette Creator" has a function of "Mass installation". You can replicate configuration files and modify a replicated file by using this function, depending on individual server system (see Chapter 6).

INSTALLATION NOTICE

This subsection provides information on installing Microsoft® Windows Server™ 2003 in the server. Read instruction in this section before proceeding the installation.

> **NOTE:** If you want to install the Windows Server 2003 without using Express Setup, see Appendix E.

About Windows family

Express Setup supports the installation of the following Windows 2003 editions:

- Microsoft® Windows Server® 2003 Standard Edition / Microsoft® Windows Server® 2003 Enterprise Edition (hereinafter, referred to as "Windows Server 2003")
- Microsoft® Windows Server® 2003 R2 Standard Edition / Microsoft® Windows Server® 2003 R2 Enterprise Edition (hereinafter, referred to as "Windows Server 2003")

> **NOTE:** Express Setup does not support the installation of Windows Server x64 Editions. If you want to install it, see Appendix D.

If you want to install the other editions, contact your service representative.

Installing Optional Mass Storage Driver

To install optional mass storage driver, see "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6 to create setup inf file.

BIOS Settings

Confirm if the BIOS settings are correct before installing the Windows Server 2003. See Chapter 4 to confirm the settings.

NEC ESMPRO Agent

NEC ESMPRO Agent requires to install the necras.sys driver on your Windows system. If you install the Windows without using the Express Setup, run the "Update Express5800 system" in Master Control Menu.

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive if necessary.

Supported Mass Storage Controllers

The NEC EXPRESSBUILDER CD-ROM attached to your system supports the following mass storage controllers for installation.

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed below, see "Installing with the OEM-FD for Mass storage device" and "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6.

- Controllers supporting installation of OS with Express Setup
  - N8103-91 Disk Array Controller (Internal SAS HDD)*
  - N8103-99 Disk Array Controller (0ch)*
  - LSI Logic Embedded MegaRAID™ (embedded on the mother board)
- Other controllers
  - N8103-80F Disk Array Controller (SCSI 1ch)*
  - N8103-81F Disk Array Controller (SCSI 2ch)*
  - N8103-75 SCSI Controller*
  - N8103-95 SCSI Controller*
  - N8190-126 SCSI Controller*

* Option.

Windows Server 2003

Express Setup can install the Windows Server 2003.

Confirm below notes before installing the Windows.

IMPORTANT:

- Complete all the process of hardware settings (BIOS and optional board settings) before starting the installation.
- See "Setup for Solving Problems" after completing Express Setup.

Installing on the Mirrored Volume

If you want to install Windows Server 2003 on the volume that is mirrored using "Disk Management", invalid the mirroring before operating the installation to set back to the basic disk, and valid the mirroring again after the installation has completed.

Creating, invalid, delete mirror volume can be operated from "Disk Management" in "Computer Management".

Mounting MO Device

Do not mount an MO device on your server during the Windows installation.

About Removable Media

Do not set removable media, such as DAT, into the device mounted on your server during the OS installation.

Connecting Hard Disk Drive

Do not connect the other hard disk drives except the drive that you want to create as the Windows system drive.

If you create multiple logical drives in your system, refer to "Re-installing the operation system when multiple logical drives exist" (Appendix D).

Creating Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system + Paging File Size + Dump File Size
+ Application Size
Size necessary to install the system = 3500MB (Windows Server 2003 R2)
3500MB
(Windows Server 2003 with Service Pack1)
4400MB
(Windows Server 2003 + Service Pack1 CD-ROM)
Paging File Size (Recommended) = Mounted Memory Size * 1.5
Dump file Size = Mounted Memory Size + 12MB
Application Size = Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

3500MB + (512MB * 1.5) + (512MB + 12MB) + Application Size
= 4792MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

Re-installing to the hard disk drive which has been upgraded to Dynamic Disk

You cannot re-install Windows Server 2003 with the current partition of the hard disk drive upgraded to Dynamic Disk kept remained.

If you want to keep the current partition remained, see Appendix D to re-install the system.

About Maintenance Partition (the area displayed as "MAINTE_P")

The maintenance partition for server maintenance is reserved in the head of Hard Disk Drive (a partition of approximately 55MB).

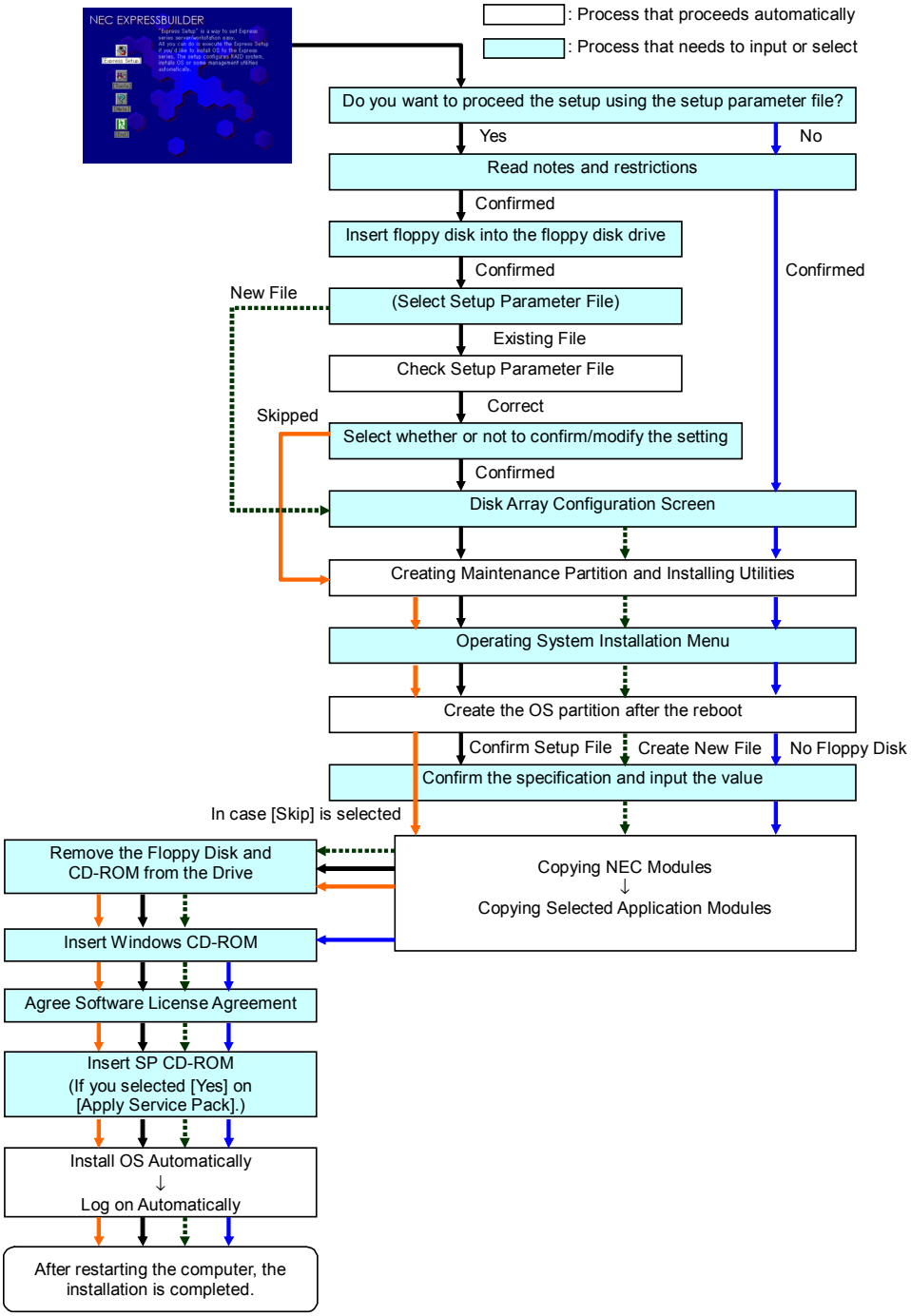
This area is for saving some maintenance utilities. Do not delete the maintenance partition.

Application of Service Pack

When using Windows Server 2003 with this equipment, surely apply ServicePack 1. When installing Windows Server 2003 R2, it is not necessary to apply Service Pack 1.

INSTALLATION FLOW

This section shows the flow of the Express setup.


NEC EXPRESSBUILDER
: Process that proceeds automatically
: Process that needs to input or select
Do you want to proceed the setup using the setup parameter file?
Yes
No
Read notes and restrictions
Confirmed
Insert floppy disk into the floppy disk drive
Confirmed
Confirmed
New File
(Select Setup Parameter File)
Existing File
Check Setup Parameter File
Correct
Skipped
Select whether or not to confirm/modify the setting
Confirmed
Disk Array Configuration Screen
Creating Maintenance Partition and Installing Utilities
Operating System Installation Menu
Create the OS partition after the reboot
Confirm Setup File
Create New File
No Floppy Disk
Confirm the specification and input the value
In case [Skip] is selected
Remove the Floppy Disk and CD-ROM from the Drive
Copying NEC Modules
↓
Copying Selected Application Modules
Insert Windows CD-ROM
Agree Software License Agreement
Insert SP CD-ROM
(If you selected [Yes] on [Apply Service Pack].)
Install OS Automatically
↓
Log on Automatically
After restarting the computer, the installation is completed.

INSTALLING THE WINDOWS SERVER 2003

Express Setup proceeds the setup by specifying the necessary information on the wizard. You can also save the setup information created on the wizard in a floppy disk as a setup file.

NOTES:

- Prepare a floppy disk to use as Configuration Disk if you want to save the parameters or use the drivers located on the "OEM-Disk for Mass Storage Device" that ships with optional boards. When using the floppy disk, the Express setup can continue the setup without specifying the parameters.
- The remote KVM console cannot use the mouse in Procedures 1-14. Operate on the keyboard.

  → key: Used to move to the next screens.
  ← key: Used to return to the previous screen.
  ↑ ↓ key: Used to select a menu.
  F1 key: Displays help.
  ENTER key: Used to select [OK] or to decide each item.
  ESC key: Used to select [Cancel].

1. Turn the power of peripheral device on, and then turn on the server.

NOTES:

- Do not mount an MO device on your server during the Windows installation.
- Do not connect the other hard disk drives except the drive that you want to create as the Windows system drive.
- If you create multiple logical drives in your system, refer to "Reinstalling the operation system when multiple logical drives exist" (Appendix D).

2. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive of the server.
3. Press Ctrl, Alt, and Delete to reboot from the NEC EXPRESSBUILDER.

   The system boots from the CD-ROM and NEC EXPRESSBUILDER starts.
4. Click [Express Setup].

IMPORTANT: Express Setup overwrites the contents of you hard disk. If you have data you want to keep, follow the directions on the screen in Express Setup.

5. The message, "Do you want to use the parameters file in order to set up the Express server or workstation?", appears.

If you want to use the parameters file, click [Yes]. If not, click [No].

6. "NOTE" appears. Click [Confirm] after reading that.

> **NOTE:** If any operating systems have been installed on the hard disk drive already, the message that prompts you to select continuing or stopping appears.

7. If you select "Yes" at step 5, place a floppy disk into the floppy disk drive mounted on the server.

If not, go on the next step.

> **NOTE:** If you set the floppy disk at this step, do not remove the floppy disk from the server until the message as removing the floppy disk appears.

[Using the existing Configuration Disk]

The parameters files in the floppy disk is listed in dialogue-box.

1) Select a parameters file to use in the Express Setup.

   After the parameters file is specified, the message "Do you want to review or modify the Setup File parameters?" appears.

2) If you want to modify or confirm the parameters file, click [Review]. If not, click [Skip].

   Click [Review] → Go on the next step.
   Click [Skip] → Go on the step 9.

[Using a blank disk]

1) Click the box under [Setup File Name: (A)] or press **A**.

   The dialog box appears.

2) Input the file name and click [Use].

8. If you are using a blank floppy disk or if you have chosen to review/change parameters, a series of configuration file screens display as below.

If you have a RAID board installed, the [Configure RAID] screen displays first. Confirm the parameters, modify if necessary, and then click [OK].
The Express Setup automatically performs the RAID configuration, creating Maintenance partition and installing several utilities.

> **NOTE:** If you have RAID hardware installed or the onboard RAID controller is enabled, and the [Configure RAID] screen fails to display, you must resolve the RAID problem in order to continue with the installation. Refer to the RAID documentation or Chapter 4.

If you do not have RAID, the [Operating System Installation] screen displays.

9. Select the installing Operating system.

Select "Windows" from the menu.

10. Next, [Basic Information] wizard appears. Confirm the parameters, modify if necessary, and then click [Next].

After that, click [Next], [Back], or [Help] on the screen to continue. Modify the parameters each time if necessary.

IMPORTANT:

- Reserve the partition to install the OS more than the minimally required size.
- If you select "Use Existing Partition" at "System Partition", the information included in the first partition (excluding maintenance partition) will all be formatted and deleted. The information included in the other partition will be retained. In the figure below, describes the partition which information will be deleted when maintenance partition exists.

First Partition <Maintenance Partition> Retained	Second Partition Deleted	Third Partition Retained	Fourth Partition Retained

- You can not re-install the system with the existing partition that is upgraded to Dynamic Disk remained. Do not select "Use Existing Partition" at "System Partition".
- If you specify other than 4095MB for the "Installing Partition", it is necessary to convert to NTFS.
- If "Use Existing Partition" at "System Partition" is selected but the partition other than the one to install Windows Server 2003 does not exist (excluding maintenance partition), Express Setup will reserve the maximum area of the hard disk drive to install Windows Server 2003.
- You can not go to the next screen if the specification is incorrect.
- To specify the setup parameters, the number of characters must not exceed the limit as shown in the table below.
  (Double-byte character is counted as 2 characters.)

Item	Value specified	Max. number of characters
Create Users	User Name	19
	Group Name	20
	Full Name	63
	Explanation	47
Create Groups	Group Name	20
	Explanation (Group Name)	47

NOTE: If you press the F9 key in [Role of Computer], the installation will be done using the default values of Express Setup for the settings afterwards automatically.
(Only when the [OK] button is displayed in the right side of the screen).

11. Copy the modules for the optional mass storage driver.

If you want to install the optional mass storage driver, insert the floppy disk attached to mass storage driver into the floppy disk drive and follow the message to operate the installation.

NOTE: You can use this function only when the floppy disk drive is attached to the system.

12. Remove the NEC EXPRESSBUILDER CD-ROM from the DVD-ROM drive according to the message.

If you proceed the setup by using setup parameter file, remove the floppy disk from the floppy disk drive.

Insert Windows Server 2003 CD-ROM into the DVD-ROM drive.

[Agree Software License Agreement] screen appears.

13. Read the agreement carefully and click [I agree.] or press **F8** if you do agree. If you do not agree, click [I disagree] or press **F3**.

IMPORTANT:

- If you do not agree to this agreement, the setup terminates and Windows Server 2003 will not be installed.
- If "NetWare Gateway (and Client) Service" is specified to install, the window to specify the details of "NetWare Gateway (and Client) Service" pops up on the first logon. Specify the appropriate value.

14. If you selected [Yes] on [Apply Service Pack] at Basic Information, follow the procedure below.

1) Follow the message to take Windows Server 2003 CD-ROM out of the CD-ROM drive.

2) Follow the message to insert Windows Server 2003 Service Pack 1 or later into the CD-ROM drive.

NOTE: About MegaRAID Storage Manager (hereinafter, refered to as "MSM")

When N8103-91 board is connected, Windows Server 2003 Service Pack 1 or later is necessary to install MSM. When you try to install MSM, and the setting of whether to apply Service Pack is [No], the following message will be displayed during the Express Setup.

```
Service Pack 1 or later is necessary
to continue the installation of MSM
(MegaRAID Storage Manager).
Apply the Service Pack ?

* If you click [No], MSM will not be installed.
          [YES]      [NO]
```

If you click [YES], Windows Server 2003 Service Pack 1 and MSM will be installed.

If you click [NO], MSM will not be installed. If you change the setting of whether to apply Service Pack or not by this message after you agreed the Software License Agreement, this change (the setting of whether to install MSM and Service Pack or not) is not reflected in the parameter file.

Windows Server 2003 and the specified application will be installed automatically and logon to the system. Install and configure the device drivers.

15. If you install Microsoft Windows Server 2003 R2, insert Microsoft Windows Server 2003 R2 Standard Edition DISC 2 or Microsoft Windows Server 2003 R2 Enterprise Edition DISC 2 into the CD-ROM drive after the OS installation.

Hereinafter, proceed operations according to the message.

When the installation has finished, remove Microsoft Windows Server 2003 R2 Standard Edition DISC 2 or Microsoft Windows Server 2003 R2 Enterprise Edition DISC 2 from the CD-ROM drive, and restart the system.

Now the Setup using Express Setup has completed.

INSTALLING AND SETTING DEVICE DRIVERS

Follow these steps to install and configure the device drivers.

PROSet

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhances throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive.
2. The [Windows Explorer] dialog starts.

   * The procedure in the case of the standard start menu

     Click Start menu and click [Windows Explorer].

   * The procedure in the case of the classic start menu

     Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "DXSETUP.EXE" in the following directory.

   DVD-ROM Drive Letter:\WINNT\DOTNET\NS4\PROSET\2KXPWS03

   The [Intel® PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Complete" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

   * The procedure in the case of the standard start menu

     1. Click Start menu, click [Control Panel], click [Network Connections], and click [Local Area Connection].

   * The procedure in the case of the classic start menu

     1. Click Start menu, click [Settings] and click [Network Connections].

        The [Network Connections] dialog box appears.

     2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

   The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel(R) PROSet] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, point to [Control Panel], [administrative tools], and click [Computer Management] and then double click the [(Network Adapter Name)] in the Network Adapter list.

   * The procedure in the case of the classic start menu

     1. Click Start menu, point to [Settings] and click [Control Panel].
     2. Click [administrative tools].
     3. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.

2. Click the [Link] and specify the [Speed and Duplex] value the same as the value specified for HUB.

3. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

NOTE: It is recommend to add [Network Monitor] at [AddingServices]. [Network Monitor] can monitor the frame (or the packet)that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-112/119/111/86/120/121/122), the network driver will be installed automatically. Therefore, the driver attached to the Network board should not be used.

If you want to utilize optional Network Board (N8104-86/111), install the driver stored in NEC EXPRESSBUILDER CD-ROM.

In case of utilizing (N8104-86/111)

"DVD-ROM Drive Letter:\WINNT\DOTNET\NS4\PRO100\WS03XP2K"

In case of utilizing (N8104-N8104-112/119/120/121/122)

"DVD-ROM Drive Letter:\WINNT\DOTNET\NS4\PRO1000\WS03XP2K"

If the procedure of installation is not clear, refer to the installation procedure described in the section "Installation of the Optional Network Board Driver".

Installation of the Optional Network Board Driver

1. Start Device Manager.
2. Click [Network adapters] and Double-Click [(Network Adapter Name)].

   [(Network Adapter Name) Properties] appears.

   NOTE: [(Intel(R) PRO/1000...)] is the name of On-Board adapter. All other names show the Optional Network Board.

3. Click [Driver] tab and click [Update Driver...]. [Hardware Update Wizard] appears.
4. Select the [Install from a list or specific location (Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and check off the [Search removable media (floppy, CD-ROM...)] check box.
6. Check the [Include this location in the search] check box and when using [(N8104-86/111)], specify
   [DVD-ROM Drive Letter:\WINNT\DOTNET\NS4\PRO100\WS03XP2K].

   Then click [Next].

   When using [(N8104-N8104-112/119/120/121/122)], specify
   [DVD-ROM Drive Letter:\WINNT\DOTNET\NS4\PRO1000\WS03XP2K].

   Then click [Next].
7. Click [Finish].

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers and restarting the system.
- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

1. The [Intel (R) PROSet] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, point to [Control Panel], [administrative tools], and click [Computer Management] and then double click the [(Network Adapter Name)] in the Network Adapter list.

   * The procedure in the case of the classic start menu

     1. Click Start menu, point to [Settings] and click [Control Panel].
     2. Click [Administrative Tools].
     3. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.

2. Select [Teaming] tab and then check on [Team with other adapters] and click [New Team...].

   The [New Team Wizard] dialog box appears. Click [Next]

   *Specify a name for the team if it necessary.

3. Select the adapters to include in team.
4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Click [Finish].
6. The setup will go back to [Intel (R) PROSet for Wired Connections] dialog box, so click [OK].
7. Restart the system.

Graphics Accelerator Driver

The graphics accelerator driver will be automatically installed by Express Setup or system update.

SCSI Controller Driver (N8103-75/95/N8190-126)

If you utilize SCSI controller driver (N8103-75/95/N8190-126), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Disk Array Controller Driver (N8103-80F/81F)

To additionally install the N8103-80F/81F in a system containing Windows Server 2003, connect the controller and take the following steps to install the driver:

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click [LSI Logic Megaraid SCSI 320-1/2] which Device Manager lists.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
7. Copying of the driver is completed, and the [Completing the Hardware Update Wizard] dialog box below appears. Click [Finish].

Notes on Using the N8103-75 Controller Board

After installing OS, the driver does not installed according to the method of installing OS occasionally.

In that case, please install the driver by the following procedures.

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click the SCSI Controller driver which Device Manager lists as Other device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify the following driver and click [Next].
   - [INITIO INI-A10XU2W PCI SCSI Controller] (When N8103-65F board is installed.)
   - [Adaptec SCSI Card 29320ALP -Ultra320 SCSI] (When N8103-75 board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

Available switch options for Windows Server 2003 Boot.ini file

Many different switches will be available if you edit Boot.ini file.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 833721

  "Available switch options for the Windows XP and the Windows Server 2003 Boot.ini files"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

  "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

   <Example of Boot.ini file>

   ```
   [boot loader]
   timeout=30
   default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
   [operating systems]
   multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003" /fastdetect
   multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, PAE" /fastdetect
   /PAE
   C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /cmdcons
   ```

   This is the end of editing Boot.ini file.

NOTE: If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

SETTING FOR SOLVING PROBLEMS

Setup the following issue in advance so that your computer can recover from any trouble precisely and as soon as possible when it should occur.

Memory Dump (Debug Information)

This section describes the procedures for collecting memory dump (debug information) in the server.

IMPORTANT: Cautions for the Memory Dump

- The staff of maintenance service representative is in charge of collecting memory dump. Customers need only to specify the memory dump.
- If any trouble occur after specifying the process below, the message to inform that the system is in short of virtual memory may appear, but continue to start the system. If you restart the system in such case, memory dump may not be stored correctly.

Follow the procedure below to specify.

1. Select [Control Panel] and click [System].

   The [System Properties] dialog box appears.

2. Select [Advanced] tab.
3. Click [Settings] on the [Startup and Recovery] group box.

IMPORTANT:

Windows Server 2003 x64 Editions

- To specify "Complete Memory Dump" to write the debug information is recommended.
  If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 1MB".
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

Windows Server 2003

- To specify "Complete Memory Dump" to write the debug information is recommended.
  If the mounted memory size is larger than 2GB, "Complete Memory Dump" cannot be specified so that specify "Kernel Memory Dump" instead.
- Specify the drive where there is a free area more than the size of "the memory capacity mounted on Express server + 12MB"(In case the memory capacity is more than 2GB, a free area of "2048+12MB" or more).
- In case the mounted memory size exceeds 2GB due to the added memory, change the write debugging information to [Kernel Memory Dump] before adding memory. The size of debugging information (memory dump) to be taken also changes due to adding memory. Verify the size of the empty space in the debugging information (memory dump) write destination drive.

4. Specify "Complete memory dump" and modify [Dump file:] in the [Write debugging information] group box.

   e.g. Write the debug information in D drive write the file name "MEMORY.DMP".

   D:\MEMORY.DMP

5. Click [Settings] on the [Performance] group box.

   The [Performance Options] window appears.

6. Click [Advanced] tab on the [Performance Options] window.

7. Click [Change] on the [Virtual memory] group box.

8. Modify [Initial Size] in the [Paging file size for selected drive] box to the value larger than [Recommended], and click [Set].

   IMPORTANT:

   - The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
     Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
   - For more information on "Recommended" value, see "Creating Partition Size" described earlier.
   - In case the memory is expanded, re-specify the paging file to suit the new memory size.

9. Click [OK].

   The message to restart the system may appear according to the modified specification. In such case, follow the message to restart the system.

Windows Dr. Watson

Windows Dr. Watson is a debugger for application errors. If any application error is detected, Dr. Watson diagnoses the server and logs diagnostic information (log). Follow the procedure below and specify Dr. Watson to collect diagnostic information.

1. Click [Run] on Start menu.
2. Type "drwtsn32.exe" in the [Open] box, and click [OK].

   The [Dr. Watson for Windows] dialog box appears.
3. Specify the location to store the diagnostic information in the [Log File Path] box.

   The diagnostic information will be stored with the file name "DRWTSN32.LOG".

   NOTE: You can not specify network path. Specify the path on local computer.
4. Specify the location of crash dump file in the [Crash Dump] box.

   NOTE: "Crash Dump File" is a binary file that can be read with Windows Debugger.
5. Check the following check box on the [Option] box.

   ☐ Dump Symbol Table
   ☐ Dump All Thread Contexts
   ☐ Add To Existing Log File
   ☐ Create Crash Dump File

   For more information on each function above, refer to Online Help.
6. Click [OK].

Network Monitor

Utilizing Network Monitor helps you to investigate and manage with network trouble. To utilize Network Monitor, you need to restart the system after the installation has completed, so we recommend to install Network Monitor before any network trouble may occur.

1. Point to [Settings] from Start menu and click [Control Panel].

   The [Control Panel] dialog box appears.

2. Double-click [Add or Remove Programs].

   The [Add or Remove Programs] dialog box appears.

3. Click [Add/Remove Windows Component].

   The [Windows Components Wizard] dialog box appears.

4. Click [Management and Monitoring Tools] and then click [Details].

   The [Management and Monitoring Tools] dialog appears.

5. Click to select the [Network Monitor Tools] check box, and then click [OK].
6. The [Windows Components Wizard] dialog box appears again, so click [Next].
7. If the setup asks to install the disk, insert the OS CD-ROM into CD-ROM drive and click [OK].
8. Click [Finish] in the [Windows Component Wizard] dialog box.
9. Close the [Add or Remove Programs] dialog box.
10. Close the [Control Panel] dialog box.

To start Network Monitor, point to [Program] → [Administrative Tools] and click [Network Monitor]. For information on how to operate Network Monitor, refer to Online Help.

INSTALLING MAINTENANCE UTILITIES

Various maintenance utilities are contained in your NEC EXPRESSBUILDER CD-ROM. See Chapter 6 for installing the utilities to your server or management workstations.

UPDATING THE SYSTEM – INSTALLING SERVICE PACK –

IMPORTANT: If you install Windows Server 2003 CD-ROM that contains Service Pack 1 to your system, you do not have to apply Service Pack 1 again.

Update the system in the situation below:

- Modified system configuration.
- Recovered the system using recovery process.

Log on to the system with the account that has administrative authority (e.g. Supervisor) and insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive of the server.

[Setup] in [Master Control Menu] screen appears, so left-click the item. Click [Update the System] from the menu and the setup will start. After that, follow the message to continue the setup process.

MAKING BACKUP COPIES OF SYSTEM INFORMATION

The system information includes the current BIOS settings and any specific information for the server.

Save the information after completing the system setup.

Without the backup data, you will not be able to recover the information.

You can save the information by the following process.

1. Insert the "NEC EXPRESSBUILDER" CD-ROM into the DVD-ROM drive and reboot the system.
2. Select [Tools].
3. Select [Off-line Maintenance Utility].
4. Select [System Information Management].
5. Insert a floppy disk into the floppy disk drive.
6. Select [Save].

Installing with the OEM-FD for Mass Storage Device

This section explains how to setup with the OEM-FD. You usually do not have to do as follows. If your system has any Mass storage devices, you have to set as follows depending on your system. The detailed information is provided by the manual of the Mass storage device.

Installation of Mass storage device not to be supported by ExpressSetup

If you would like to install or re-install the OS when the system has new mass storage device not to be supported by NEC EXPRESSBUILDER, you have to set as follows.

1. Read the manual supplied with the mass storage device before setting the server.
2. If the mass storage device is disk array controller, configure the RAID system before running the NEC EXPRESSBUILDER.
3. Boot the system from the NEC EXPRESSBUILDER CD-ROM.
4. (a) When the dialog of Disk array configuration appears, check "Use Existing Array".

   (b) Check "Apply OEM-FD for Mass storage device".
5. Copy the driver for the mass storage device in the ExpressSetup.

   Insert the floppy disk attached the mass storage device into the floppy disk drive.

   Continue the ExpressSetup, referring to messages displayed on the display.

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Chapter 6

Installing and Using Utilities

This section describes how to use the NEC EXPRESSBUILDER CD-ROM that comes with your server and to install the utilities stored on the NEC EXPRESSBUILDER.

NEC EXPRESSBUILDER

NEC EXPRESSBUILDER has some maintenance utilities and management software. NEC EXPRESSBUILDER also helps you to install NOS (Windows Server 2003).

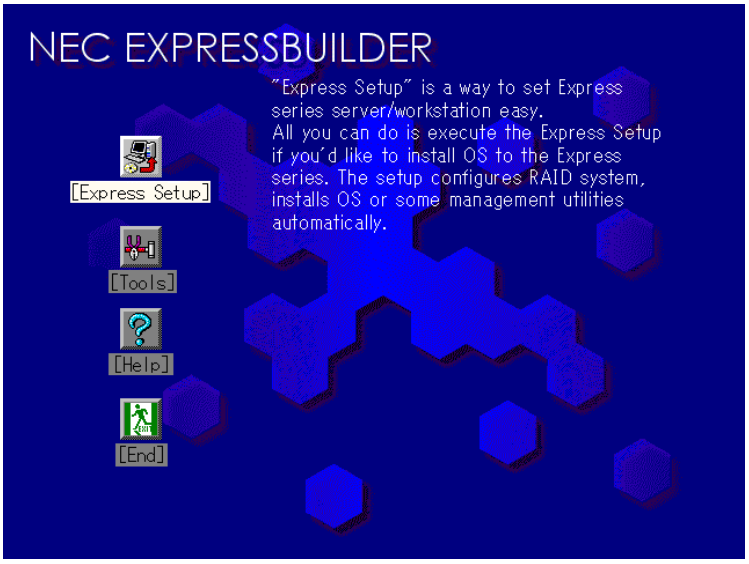
> **NOTE:** Before using NEC EXPRESSBUILDER for initial setup, complete the hardware configuration.

NEC EXPRESSBUILDER has two executing modes depending on your operating environments. One is for using on Windows system, and the other is booted from NEC EXPRESSBUILDER CD.

- DOS-based with local console

  The following menu appears on the local display after booting from NEC EXPRESSBUILDER CD. You can install NOS or run the diagnostic program, and so on.

> **NOTE:** A mouse can't be used when EXPRESSBUILDER is operated with the remote KVM console. Use a keyboard.


NEC EXPRESSBUILDER
"Express Setup" is a way to set Express series server/workstation easy.
All you can do is execute the Express Setup if you'd like to install OS to the Express series. The setup configures RAID system, installs OS or some management utilities automatically.
[Express Setup]
[Tools]
[Help]
[End]

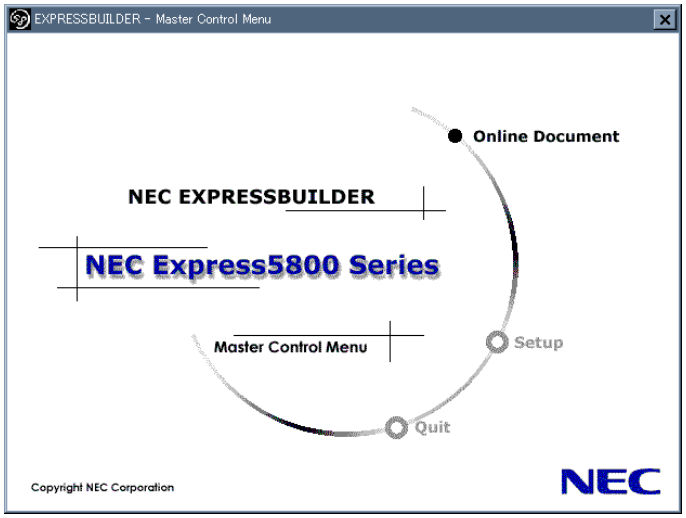
- DOS-based with remote console

  Used to set up the server from the management workstation by accessing the server over the network or via serial port B.

> **NOTE:** The "CSL_LESS.CFG" file is required to run this program. Refer to " NEC EXPRESSBUILDER for DOS-based with Remote Console" described later in this chapter for detail.

- Windows-based

  This program is called as "Master Control Menu" that can run under the Microsoft Windows system (Windows 95 or later and Windows NT 4.0 or later). You can install the several applications and read the documentation from the menu.



NEC EXPRESSBUILDER for DOS-Based with Local Console

This subsection describes the procedures for using NEC EXPRESSBUILDER for DOS-based with local console.

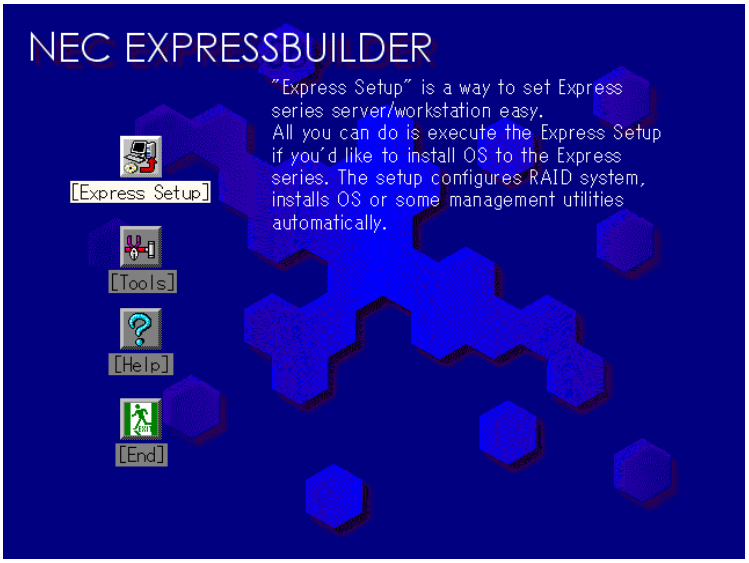
Starting NEC EXPRESSBUILDER

The following procedure instructs you to start NEC EXPRESSBUILDER.

> **IMPORTANT:** Do not remove the NEC EXPRESSBUILDER CD-ROM while NEC EXPRESSBUILDER is running.

1. Turn on peripheral devices and the server in this order.
2. Insert the NEC EXPRESSBUILDER CD-ROM supplied with your server into the DVD-ROM drive of your server.
3. Ensure that the floppy disk drive is empty.
4. Press the RESET switch or press **Ctrl**, **Alt**, and **Delete** to reboot from the NEC EXPRESSBUILDER. (You may also turn off and then on again to reboot the server.)

   NEC EXPRESSBUILDER boots up displaying the top menu.


NEC EXPRESSBUILDER
"Express Setup" is a way to set Express series server/workstation easy.
All you can do is execute the Express Setup if you'd like to install OS to the Express series. The setup configures RAID system, installs OS or some management utilities automatically.
[Express Setup]
[Tools]
[Help]
[End]

Express Setup

"Express Setup" is intended for initial setup of the server. Its automatic installation mode guides the user easily through the process by detailing specific hardware features and providing screen prompts for software selection and configuration. The program loads the utilities and drivers, applies RAID settings, partitions the disk, and installs the desired operating system.

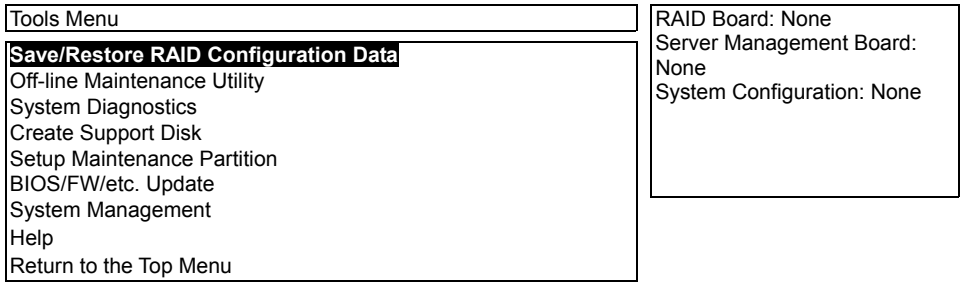
If you install Windows Server 2003, after a few tasks are completed, all that remains to be done is to remove the NEC EXPRESSBUILDER CD-ROM and install the Windows CD-ROM, input a product ID number, and acknowledge the license agreement.

IMPORTANT:

- The Express Setup is intended for the initial setup of the server system and, therefore, the Express Setup clears the contents of the hard disk drive.
- Once Express setup is started, do not remove "Configuration Diskette" from the floppy disk drive without any directions.
- Express Setup does not support the installation of Windows Server 2003 x64 Editions.

Tools

"Tools" is also intended for initial setup of the server. It provides more installation options than Express Setup and permits the user to quickly create utility support disks, run the Off-line Maintenance Utility and system diagnostic utility, set up a maintenance partition, and update the various BIOS programs.



- Save/Restore RAID Configuration Data

  The item allows the configuration information on the disk array system to be saved or restored from the floppy disk.

  – Save Disk Array Configuration Data

    The configuration information on the disk mirroring controller is saved into the floppy disk. If you set or change RAID, always use this function to save the configuration information into the floppy disk.

IMPORTANT: Some Disk Array Controllers do not support this function. In that case, this menu will not be shown.

– Restore Disk Array Configuration Data

The configuration information saved in a floppy disk is restored to NVRAM and hard disk drive on the disk mirroring controller.

If the configuration information is broken or changed by mistake, restore the configuration information.

When the defected disk array controller is replaced, the configuration information on the hard disk drive must be saved into the disk array controller.

However, if the configuration information on the new disk mirroring controller is saved into a hard disk drive, use this function to restore the configuration information.

IMPORTANT:

- Some Disk Array Controllers do not support this function. In that case, this menu will not be shown.
- This is a function for maintenance. Please do not use it except maintenance.

- Off-line Maintenance Utility

Off-line Maintenance Utility is an OS-independent maintenance program that performs preventive maintenance and error analysis for your server. See Chapter 8 or online help for details.

- System Diagnostics

Executes various tests on the server system to check if the server functions are normal and if the connection between the server and additional board is normal.

After the System Diagnostics is executed, a system check program assigned to each model starts. See Chapter 7 for details.

- Create Support Disk

NEC EXPRESSBUILDER CD-ROM contains a number of device drivers and utilities that you can put on floppy disks and load onto your system.

Using this menu creates a support disk by copying from the NEC EXPRESSBUILDER CD-ROM. If your system has the Windows operating system, you may find it more convenient to use NEC EXPRESSBUILDER for Windows-based to make support disks.

Write the displayed title on the floppy disk label, which is useful for management in the future. Customers are to provide a floppy disk to create a support disk.

– Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILER

Creates a support disk for installing Windows Server 2003 x64 Editions.

– Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER

Creates a support disk for installing Windows Server 2003. (No need to create this disk when installing the operating system with the Express Setup.)

– ROM-DOS Startup FD

Creates a support disk for starting the ROM-DOS system.

– Off-line Maintenance Utility Bootable FD

Creates a support disk for activating the Off-line Maintenance Utility.

- Setup Maintenance Partition

Maintenance partition is a specific partition for the server and created on your system disk. About 55MB of the maintenance partition includes the various maintenance utilities and executable commands.

In this menu, you can create the maintenance partition, install the various utilities, and update the utilities. The maintenance utilities installed in the maintenance partition are system diagnostics and Off-line Maintenance Utility.

IMPORTANT:

- Do not reset or turn off the server while the running this menu. If the processing is discontinued, the system becomes unable to start.
- The existence of the maintenance partition may be identified from the operating system. In order to retain the Configuration Data, do not delete the partition.

NOTES:

- The maintenance partition, once created, will not be recreated again.
- When the maintenance partition does not exist, some menu items do not appear.

– Create Maintenance Partition

NEC EXPRESSBUILDER creates about 55MB of the maintenance partition on the system disk (or disk array system) as work area. The various utilities are installed when the maintenance partition is created successfully or when the maintenance partition is already created.

– Install Maintenance Partition Utilities

Various utilities are installed in the maintenance partition from the CD-ROM.

– Update Maintenance Partition Utilities

Various utilities are copied in the Maintenance Partition from the update disk. This menu is only used when the update disk is supplied from your service representative or attached with your system.

– FDISK

Execute FDISK command of ROM-DOS system. You can create/delete partitions, etc.

- System Management

The parameters of BMC (Baseboard Management Controller) are set for remote control and alert.

- BIOS/FW/etc. Update

  This menu allows you to update the software module such as BIOS and firmware of the server by using the update disk (3.5-inch floppy disk) that is distributed from NEC customer service representative.

  After rebooting the system, an update program is started automatically from the floppy disk, and the various BIOS and firmware programs are updated.

  IMPORTANT: Do not turn off the server while the update program is running. If the update processing is discontinued, the system becomes unable to start.

- Help

  Displays explanations about various functions of NEC EXPRESSBUILDER.

- Return to the Top Menu

  Choosing this menu returns to the Top Menu.

NEC EXPRESSBUILDER for DOS-based with Remote Console

This subsection describes the procedures for using NEC EXPRESSBUILDER for DOS-based with remote console.

NEC EXPRESSBUILDER contains the remote console feature that allows the system administrator to set up the server from the management workstation (management PC) via the network or the server's COM B (serial) port.

IMPORTANT:

- Do not use this feature on any other computer than the server, or on any other server obtained without the NEC EXPRESSBUILDER. Doing so may cause a failure of the server.
- When a keyboard is connected to the server, the remote console feature is disabled. The NEC EXPRESSBUILDER determines that the server has a console. (Nothing is displayed on the management PC.)
- If you fail to configure the disk array controller N8103-80F or 81F from the remote console, try again using the server console.
- The system may fail to operate with the transfer rate of 115.2 Kbps for serial console redirection. Specify any other transfer rate than 115.2 Kbps.

Starting

The following two methods are available to start the server.

- Running NEC EXPRESSBUILDER from the management PC via LAN
- Running NEC EXPRESSBUILDER from the management PC via direct connection (COM B)

For the procedure for starting NEC EXPRESSBUILDER for DOS-based with Remote Console, see "NEC DianaScope".

IMPORTANT:

- Do not change the boot device order in BOOT menu in BIOS SETUP. NEC EXPRESSBUILDER cannot be used if the DVD-ROM drive is not the first device to launch the system.
- To use this feature, you need to create a configuration file (3.5-inch floppy disk) that includes communication method between the server and the management PC, and various setup parameters. Use NEC DianaScope or run "System Management" menu from NEC EXPRESSBUILDER to create a configuration file. Save the configuration file into the root directory of the floppy disk as the following file name.

  - File name: CSL_LESS.cfg

NOTE: The following items of BIOS setup information will be set as shown below.

- LAN Controller: [Enabled]
- Serial Port A: [Enabled]
  Base I/O Address: [3F8]
  Interrupt: [IRQ 4]
- Serial Port B: [Enabled]
  Base I/O Address: [2F8]
  Interrupt: [IRQ 3]
- BIOS Redirection Port: [Serial B]
- Baud Rate: [19.2K]
- Flow Control: [CTS/RTS]
- Console Type: [PC ANSI]

Top Menu

Shown below are the top menu items.

- Setup

  Automatically sets up the server.

- Tools

  Launch the features of NEC EXPRESSBUILDER individually.

- Help

  Help message on NEC EXPRESSBUILDER.

- Quit

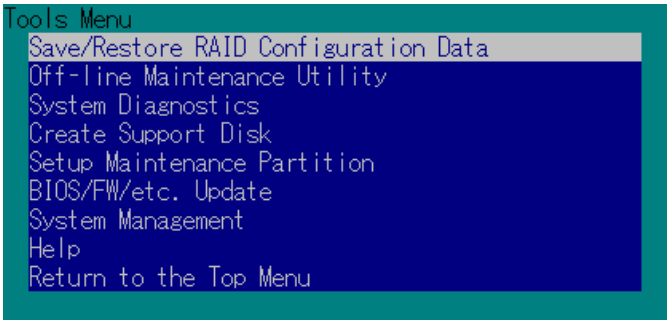
  Quit NEC EXPRESSBUILDER.

Setup

The NEC EXPRESSBUILDER checks the hardware configuration of the server. The disk array and maintenance partition are automatically configured.

Tools

When you select the [Tools] on the Top Menu, the following screen appears.



The menu items available only in remote console operation among those described in section "NEC EXPRESSBUILDER for DOS-based with Local Console" are displayed. See the previous subsection for detailed explanation of menu items.

IMPORTANT: The following is varied from the [Tools] menu in the local console mode.

- Test items and operation method of System Diagnostics. See Chapter 7 for details.

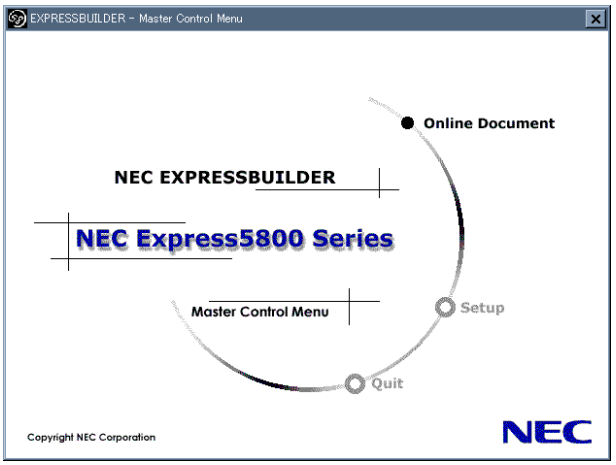
NEC EXPRESSBUILDER for Windows-Based (Master Control Menu)

The Master Control Menu is used to,

- Read the User's Guide or the other documents,
- Update the server system (Windows drivers), and
- Install the management software.

NOTES:

- Master Control Menu requires Microsoft Windows 95 (or later) or Windows NT 4.0 (or later).
- Some documents are provided in the PDF format. Use the Adobe Reader to read these documents.



Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive. Master Control Menu appears on the screen automatically. If the Autorun function is invalid in your system, run the \MC\1ST.EXE file in the CD-ROM directly. Some menu items are grayed-out when the logon user does not have the authority of the administrator or the menu item is not available for your system.

To use Master Control Menu,

- Click on [Online Document], [Setup] or [Quit], or
- Click the right mouse button on Master Control Menu window.

CONFIGURATION DISKETTE CREATOR

"Configuration Diskette Creator" is a tool to create [Configuration Diskette] that is used for configuring the server with the Express Setup (see Chapter 5 for details).

If you use the Configuration Diskette created by the Express Setup and Configuration Diskette Creator to operate the setup, you can setup from the installation of OS to several utilities automatically except for a few key input to confirm the specification. Also, you can install the system with the same specification as before when re-installing the system. We recommend you to create [Configuration Diskette] to setup the servers from NEC EXPRESSBUILDER.

IMPORTANT: You can not create [Configuration Diskette] for Microsoft Windows Server 2003 x64 Editions.

NOTE: You can install Windows Server 2003 without [Configuration Diskette]. Also, you can modify/newly create [Configuration Diskette] during the setup with NEC EXPRESSBUILDER.

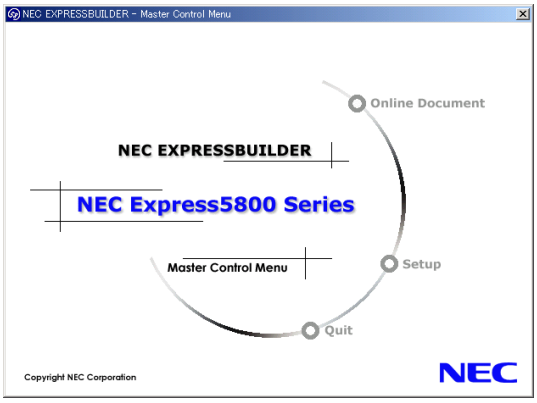
Creating Configuration Diskette

This section describes about specifying setup information that is necessary for OS installation and creating [Configuration Diskette]. Follow the procedure below.

NOTE: In the procedure below, the folder name that is specified when installing Trekking command is assumed as [Configuration Diskette Creator].

1. Start the OS.
2. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive.

   Master Control Menu will appear.
3. Right-click on the screen or left-click [Setup]. The menu will appear.

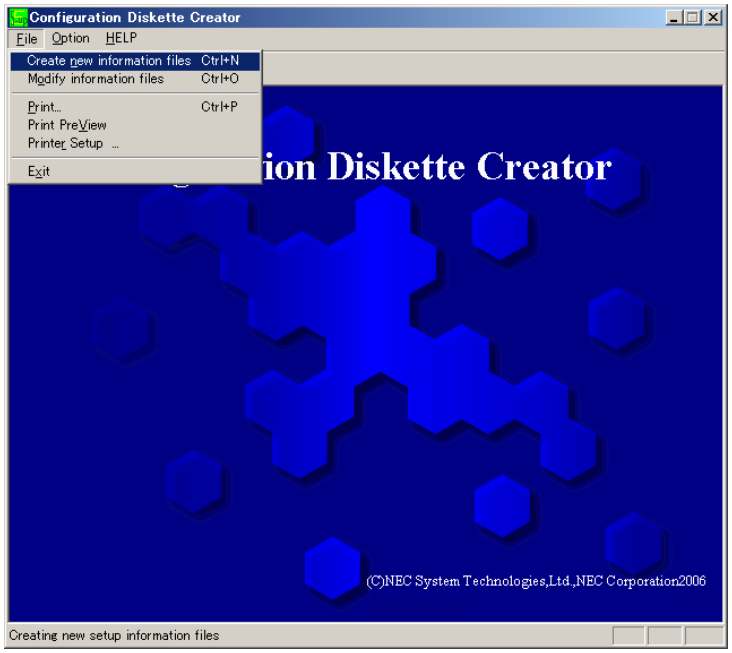


4. Click [Configuration Diskette Creator].

   Configuration Diskette Creator window is displayed.

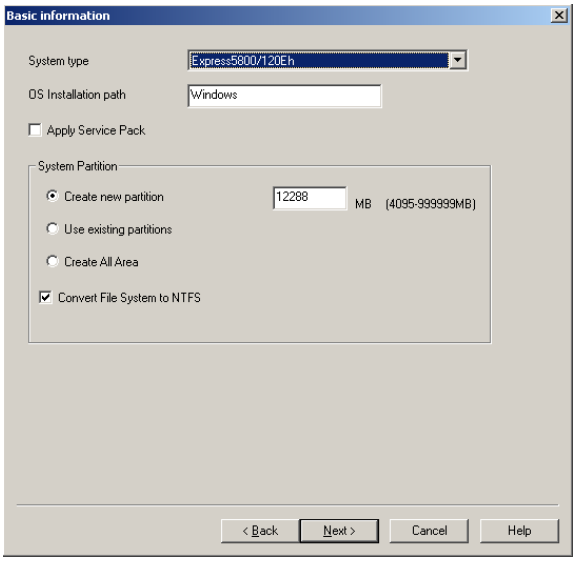
5. Click [Create New Information files] from the [File] menu.

   The [Disk Environment] dialog box will be displayed.



6. Specify each item and click [OK].

   The dialog boxes to specify setup information will be displayed in order, such as [Basic Information] dialog box.

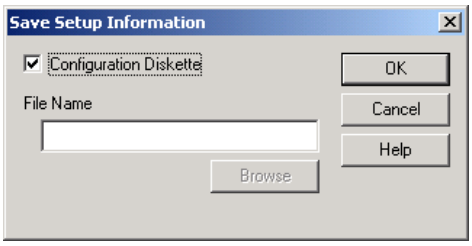


7. Follow the message to specify each item on the dialog box and click [Next].

> **NOTE:** If you click on [Cancel], all the input value will be deleted.

When completing the specification of setup information, the [Save Setup Information] dialog box will appear.

8. Confirm that the [Configuration Diskette] check box is checked, and input file name for the Setup File in [File Name].



9. Insert the floppy disk formatted by 1.44MB into the floppy disk drive and click [OK].

Now [Configuration Diskette] has been created. [Configuration Diskette] is used when you install Windows Server 2003. Put a label and keep it where it will not be lost.

> **NOTE:** For the information on the contents of each specifying item, refer to the Help.

If you want to modify the information file that already exists, click [Modify information files] on Configuration Diskette Creator window. Refer to the Help to modify the inf file.

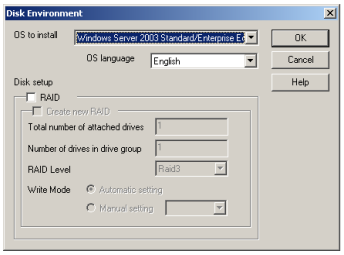
Installing Optional Mass Storage Driver

To install optional Mass Storage Driver that is supported by the Express Setup, follow the procedure below to create [Configuration Diskette].

1. Display Configuration Diskette Creator window.
2. From the [File] menu, click [Create new information files].

   [Disk Environment] dialog box will be displayed.
3. Specify each item and click on [OK].

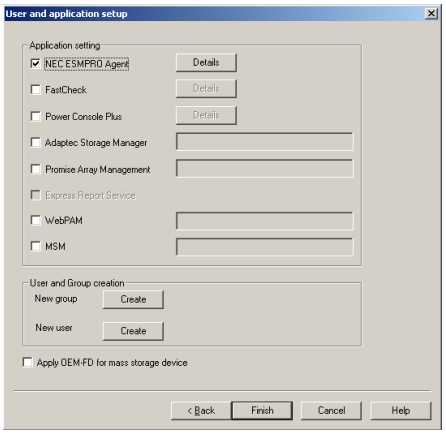
   The dialog boxes to specify setup information will be displayed in order, such as [Disk Environment] dialog box.



4. Follow the message to specify each item on the dialog box and click on [Next].

   NOTE: If you click on [Cancel], all the input value will be deleted.

5. When [User and application setup] is displayed, check [Apply OEM-FD for mass storage device].



6. When the [Save Setup Information] dialog box is displayed, confirm that the [Configuration Diskette] check box is checked, and input file name for the Setup File in [File Name].
7. Insert the floppy disk formatted by 1.44MB into the floppy disk drive and click on [OK].

NEC ESMPRO

The NEC ESMPRO lets a system administrator manage remote servers across a network. NEC ESMPRO monitors server hardware and software configurations, failures, and performance. With log data collected by NEC ESMPRO, a system administrator can track long-term and short-term performance, monitor server usage, create graphs to record trends, and check server failure rates. The administrator can use the information collected to create more efficient data routing procedures and optimize server usage.

Functions and Features

NEC ESMPRO offers many functions and features for managing remote servers across a network. These features help the system administrator perform daily system operation, system extension, and transfer tasks. Some features of NEC ESMPRO Manager include:

- Hardware and software server configuration
  - Hardware resources mounted in servers, such as the CPU, memory, disks, disk arrays, and LAN boards.
  - Software resources, such as operating system information and drivers running on each server.
- Server failures
  - On-screen real-time displays provide the system administrator with the failure type, location, cause, and suggested corrective action.
  - Failure data includes hardware failure information such as system board temperature, memory failure, crashes, and software failure information.
- Performance
  - NEC ESMPRO monitors server performance and displays server usage on the screen and displays information, such as the rate of CPU load, memory usage, disk usage, and LAN traffic. Usage threshold values can help the system administrator monitor and prevent server overloads.

For installation procedure and detailed explanations on NEC ESMPRO, refer to the online document in the NEC EXPRESSBUILDER CD-ROM.

Power Console Plus

Power Console Plus is a utility to control the RAID system of the disk array controller (MegaRAID controller) produced by LSI Logic. Use of Power Console Plus enables operations (e.g., monitoring and maintenance) of RAID systems that are constructed on local NEC Express servers and NEC Express servers connected through networks (TCP/IP). The operations can be done online on graphical screens without the system being stopped.

Major Functions

Power Console Plus has the following features:

- Supporting the Wizard function to facilitate configuration
- Enabling the change of RAID levels
- Being compatible with SAF-TE
- Supporting the performance monitor
- Supporting enclosure functions such as temperature monitoring, power monitoring, and fan monitoring
- Enabling the settings of Write, Read, and Cache policies for each logical drive
- Supporting the save and restore functions for configuration
- Enabling the display of the SCSI transfer rate

Components

Power Console Plus consists of the following five components:

- SNMP Agent

  This function is not yet supported. Do not install SNMP Agent.

- MegaRAID Service Monitor

  Enables NEC ESMPRO to monitor the MegaRAID controller by registering event logs. Install MegaRAID Service Monitor in the NEC Express server in which the MegaRAID controller is mounted.

- MegaRAID Client

  Controls the RAID system on graphical screens. Install MegaRAID Client in the NEC Express server in which the MegaRAID controller mounted or in the management PC that is connected through the NEC Express server and network.

- MegaRAID Server

  Enables control of the MegaRAID controller via the network. Install MegaRAID Server in the NEC Express server in which the MegaRAID controller mounted.

- MegaRAID Registration Server

  Enables control of the MegaRAID controller via the network. Install in one of NEC Express servers and management PCs that are connected through network. The above components must be installed correctly for establishing the environment to use Power Console Plus.

Power Console Plus components to be installed are different between the target servers and management PC.

- Server:
  NEC Express server in which the MegaRAID controller is mounted

  Install the following three components in this server:

  – MegaRAID Service Monitor

  – MegaRAID Server

  – MegaRAID Client

- Management PC:
  Management PC that monitors and controls servers via the network (TCP/IP)

  When managing array on Terminal Server working on Windows NT Server Version 4.0 Terminal Server Edition, prepare PC, and install Management PC component. Management PC does not guarantee operation on Client, which used Terminal Server, Terminal Server Emulator, WBT.

  Start Power Console Plus of management PC, after the Power On machine that installed "Server" and "Management Server".

  Install the following component in this PC:

  – MegaRAID Client

- Management server:
  Machine that manages all servers that are monitored and controlled by management PCs

  Install the following component in one of the servers or management PCs:

  – MegaRAID Registration Server

Server Setup

This section explains Power Console Plus setup in the NEC Express server in which the MegaRAID controller is mounted.

Operating Environment

This section explains the operating environment required for Power Console Plus to operate on a server.

- Hardware
  - Machine:

    NEC Express5800 series connected with the AMI disk array controller (A)
  - Memory:

    Size large enough for OS operation + 8MB or more
  - Free space of the hard disk drive:

    5MB or more
  - Display unit:

    Screen size 1024 × 768 or larger
  - Required peripheral equipment:

    Network Interface card

    CD-ROM unit

    Pointing device such as a mouse
- Software
  - Microsoft Windows NT version 4.0

    (Windows NT Version 4.0 Service Pack 6a or later + Internet Explorer 5.5 or later)
  - Microsoft Windows 2000

Management PC Setup

This section explains Power Console Plus setup in a computer that manages servers via the network (TCP/IP).

Operating Environment

This section explains the operating environment required for Power Console Plus to operate on a management PC.

- Hardware
  - Machine:

    NEC Express5800 series

    PC/AT-compatible machine (which contains Intel Pentium or a CPU at least equivalent to it)
  - Memory:

    Size large enough for OS operation + 8MB or more
  - Free space of the hard disk drive:

    5 MB or more
  - Display unit:

    Screen size 1024 × 768 or larger
  - Required peripheral equipment:

    Network Interface card

    CD-ROM unit

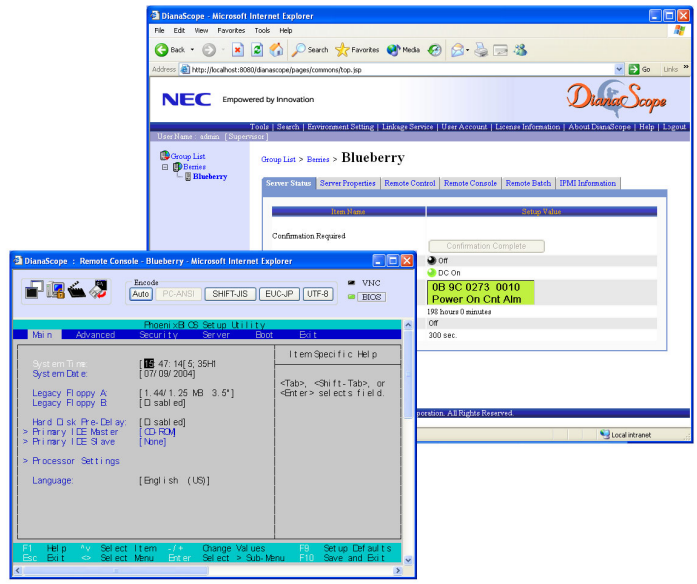
    Pointing device such as a mouse
- Software
  - Microsoft Windows NT Version 4.0

    (Windows NT Version 4.0 Service Pack 5 or later + Internet Explorer 4.01 Service Pack 2 or later)
  - Microsoft Windows 2000
  - Microsoft Windows 95/98/Me

NEC DianaScope

NEC DianaScope is software for the remote management of the server.

See the online documents for details on the functions and installation of NEC DianaScope.



NOTE: You need the server license to activate DianaScope for this product. The server license below is attached to this product.

- DianaScope Additional Server License (1)

MegaRAID Storage Manager™ (Server)

MegaRAID Storage Manager™ (hereinafter abbreviated to MSM) is an application to manage or monitor the "LSI Logic Embedded MegaRAID™", "N8103-90/91/99 disk arrary controller" and "LSI Logic MegaRAID™ SAS PCI EXPRESS™ ROMB". You can use MSM for management of arrays and error notification by event monitoring while the system is running.

Before attempting to operate MSM, read the "MegaRAID Storage Manager™ User's Guide" included in NEC EXPRESSBUILDER CD-ROM. The manual explains the MSM installation procedure and notes on operating MSM.

Setup with Express Setup

You can install MSM with Express Setup contained in NEC EXPRESSBUILDER CD-ROM. When you start the Express Setup, a dialog to specify an application appears. Select [MSM] on the dialog.

Manual Setup

See the online document "MegaRAID Storage Manager™ User's Guide contained in NEC EXPRESSBUILDER CD-ROM for details.

MegaRAID Storage Manager™ (Management PC)

Install the MegaRAID Storage Manager™ (hereinafter abbreviated to MSM) in a management PC that manages servers via the network.

Before attempting to operate MSM, read the "MegaRAID Storage Manager™ User's Guide" included in NEC EXPRESSBUILDER CD-ROM. The manual explains the MSM installation procedure and notes on operating MSM.

Chapter 7

Maintenance

This chapter describes the daily maintenance of the server and precautions when relocating or storing the server.

MAKING BACKUP COPIES

NEC recommends you make backup copies of your valuable data stored in hard disk drives of the server on a regular basis. For backup storage devices suitable for the server and backup tools, consult with your service representative.

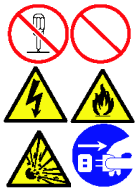
When you have changed the hardware configuration or BIOS configuration, select "System Information Management" and then "Save" of the Off-line Maintenance Utility to make a backup copy of the system information.

Also make a backup copy of the disk array configuration data if your system is in the array configuration. When your hard disk drives have been auto-rebuilt due to a failure, it is recommended to make a backup copy of the configuration data. To make a backup copy of the configuration data, use the configuration utility that is resident in the FLASH memory on the optional disk array controller board. Refer to the manual supplied with the board.

CLEANING

Clean the server on a regular basis to keep the server in a good shape.

⚠ WARNING



Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Disconnect the power plug before working with the server.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Avoid installation in extreme temperature conditions.
- Make sure to complete board installation.

Cleaning the Server

For daily cleaning, wipe the external surfaces of the server with a dry soft cloth. Follow the procedure below if stains remain on the surfaces:

IMPORTANT:

- To avoid altering the material and color of the server, do not use volatile solvents such as thinner and benzene to clean the server.
- The power receptacle, the cables, the connectors on the rear panel of server, and the inside of the server must be kept dry. Do not moisten them with water.

1. Make sure that the server is off-powered (the POWER/SLEEP LED goes off).
2. Unplug the power cord of the server from a power outlet.
3. Wipe off dust from the power cord plug with a dry cloth.
4. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
5. Rub off stains on the server with the cloth prepared in Step 4.
6. Soak a soft cloth in water, squeeze it firmly, wipe the server with it once again.
7. Wipe the server with a dry cloth.
8. Wipe off dust from the fan exhaust opening on the rear of the server with a dry cloth.

Cleaning the Interior

One of the most important items in a good maintenance program is regular and thorough cleaning of the interior of the server, especially around the mother board.

Dust buildup inside the server can lead to several problems. As dust acts as a thermal insulator, a buildup can prevent proper system cooling. Excessive heat will shorten the life of server components. Also, dust may contain conductive or corrosive materials that can cause short circuits or corrosion of electrical contacts.

How often you should clean the interior of the server depends on the environment in which it is located. For most office environments, you probably should clean the server every 12 months. For more severe environments, clean the interior every 6 months.

Cleaning the interior of the server entails powering off the server and removing the left side cover. You will need a small vacuum cleaner (with plastic tipped nozzle and electrostatic protection), computer grade canned air, and a small brush for cleaning the interior.

Follow the procedure below to clean the interior of the server.

⚠ WARNING

Unplug all power cords.

Unplug all power cords before performing any maintenance. Voltage is present inside the server and display unit even after the power is turned off. All voltage is removed only when the power cord is unplugged.

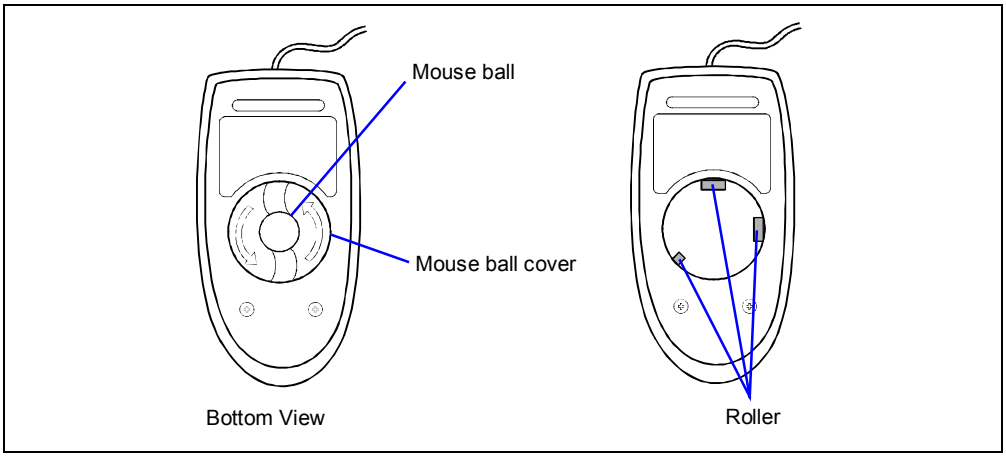
1. Turn off the server and unplug all power cables.
2. Remove the logic cover and drive cover. (See Chapter 9.)
3. Use a small brush to loosen any dust and debris on the mother board.
4. Use computer grade canned air to blow dust off components on the mother board.
5. Use a small vacuum cleaner with plastic tip to vacuum out dust and debris from the interior of the server.
6. Reinstall the covers. (See Chapter 9.)
7. Reconnect all power cables and turn on the server.

Cleaning the Keyboard/Mouse

Make sure that the server and peripheral devices are all off-powered (the POWER/SLEEP LED goes off), and then wipe the keyboard surface with a dry cloth.

The mouse operation depends on the degree of smoothness of the internal ball rotation. To keep the mouse ball clean, use the mouse in a place with little dust. Follow the steps below to clean the mouse regularly:

1. Prepare cold or lukewarm water, neutral detergent, alcohol, two dry soft clothes, and cotton swabs.
2. Make sure that the server is off-powered (the POWER/SLEEP LED goes off).
3. Turn the mouse upside down, and rotate the mouse ball cover counterclockwise to remove it.
4. Take out the ball from the mouse. Cover the bottom of the mouse with your hand, and turn your hand holding the mouse (the mouse is on your palm with the button upward). The mouse ball is released onto your palm.



5. Soak a soft cloth in neutral detergent that is diluted with cold or lukewarm water, and squeeze it firmly.
6. Rub off stains on the mouse ball. Softly wipe the mouse ball with the cloth prepared in Step 5.
7. Wipe the mouse ball with a dry soft cloth.
8. Wipe three small rollers inside the mouse with a cotton swab soaked with alcohol. Wipe stains slowly and carefully by rotating rollers with the tip of the cotton swab.
9. Blow out any dust from the mouse. Protect your eyes from the dust.
10. Put the mouse ball back into the mouse.
11. Place the mouse ball cover, and rotate it clockwise until it is locked.

Cleaning Disc

A dusty disc or dust-accumulated tray causes the device to fail to read data correctly.

Follow the procedure below to clean the tray and disc regularly:

1. Make sure that the server is powered (the POWER/SLEEP LED is lit).
2. Press the CD tray Open/Close button on the front of the DVD-ROM drive. The tray opens.
3. Hold the disc lightly and take it out from the tray.

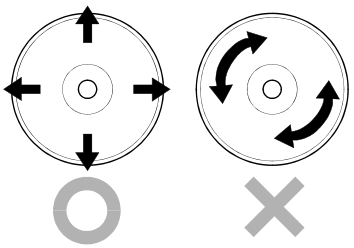
   NOTE: Do not touch the signal side of the disc with your hand.

4. Wipe the tray with a dry soft cloth.

   IMPORTANT: Do not wipe the lens of the DVD-ROM drive. Doing so may damage the lens and may cause a malfunction of the drive.

5. Push on the tray front to close the tray.
6. Wipe the signal side of the disc with a dry soft cloth.

   IMPORTANT: Wipe disc from the center to the outside. Use only disc cleaner if necessary. Cleaning a disc with record spray/cleaner, benzene, or thinner causes damage to the disc contents. At worst, inserting the disc into the server may cause failure.



SYSTEM DIAGNOSTICS

The System Diagnostics runs several tests on the server.

Select [Tools] - [System Diagnostics] in the NEC EXPRESSBUILDER to diagnose the system.

Test Items

The following items are tested in system diagnostics.

- Memory
- CPU cache memory
- Hard disk drive used as a system

IMPORTANT: When executing the system diagnostics, make sure to disconnect the LAN cable. Executing the system diagnostics with the LAN cable connected, the network may be influenced.

NOTE: On checking the hard disk drive, no data is written into the disk.

Startup and Exit of System Diagnostics

There are two ways to diagnose the server: to use the local console (keyboard) of the server itself, and to use the management PC via serial port (remote console).

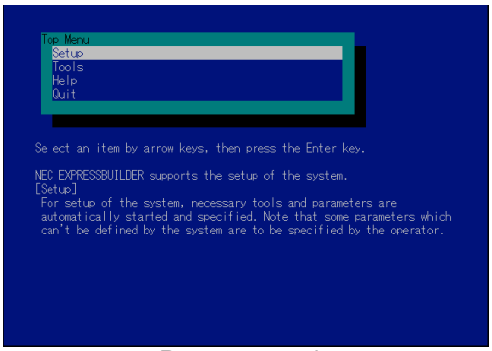
> **IMPORTANT:** Two methods of LAN and the serial port are mentioned in "NEC EXPRESSBUILDER" of Chapter 6 "Installing and Using Utilities" in the way of communicating in remote console.
> Use the serial port to execute System Diagnostics with remote console.
> The LAN connection is not for System Diagnostics.

Procedures to start the diagnostics program are as follows:

1. Shutdown the OS, and power off the server. Then, unplug the power cord.
2. Disconnect all the LAN cables from the server.
3. Plug the power cord and power on the server.
4. Use the NEC EXPRESSBUILDER CD-ROM to start the system.

   The step which the step which local console of the server is used for, and remote console are used for is different. Refer to "NEC EXPRESSBUILDER" of Chapter 6 "Installing and Using Utilities", to start the system properly. The following menu is displayed on the screen, when starting the system from the NEC EXPRESSBUILDER.

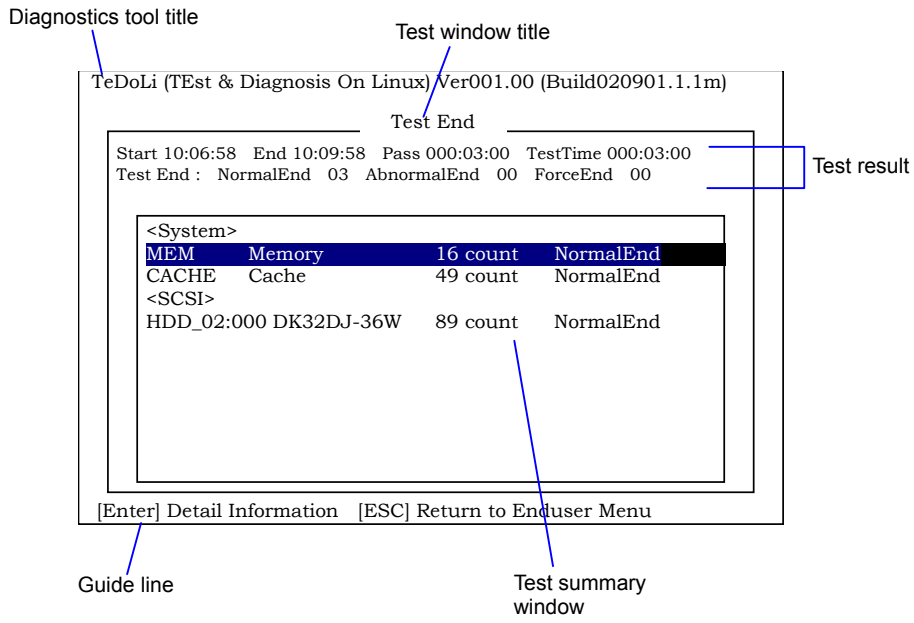
NEC EXPRESSBUILDER
"Express Setup" is a way to set express series server/workstation easy.
All you can do is execute the Express Setup if you'd like to install OS to the Express series. The setup configures RAID system, installs OS or some management utilities automatically.
[Express Setup]
[Tools]
[Help]
[End]
Local console


Top Menu
Setup
Tools
Help
Quit
Select an item by arrow keys, then press the Enter key.
NEC EXPRESSBUILDER supports the setup of the system.
[Setup]
For setup of the system, necessary tools and parameters are automatically started and specified. Note that some parameters which can't be defined by the system are to be specified by the operator.
Remote console

5. Select [Tools].

6. Select [System Diagnostics].

The system diagnostics starts and will be completed in approximately three minutes. When the diagnostics is completed, the screen of the display changes as shown below:


Diagnostics tool title
Test window title
TeDoLi (TEst & Diagnosis On Linux) Ver001.00 (Build020901.1.1m)
Test End
Start 10:06:58 End 10:09:58 Pass 000:03:00 TestTime 000:03:00
Test End : NormalEnd 03 AbnormalEnd 00 ForceEnd 00
Test result
<System>
MEM Memory 16 count NormalEnd
CACHE Cache 49 count NormalEnd
<SCSI>
HDD_02:000 DK32DJ-36W 89 count NormalEnd
[Enter] Detail Information [ESC] Return to Enduser Menu
Guide line
Test summary window

– Diagnostics tool title

  Shows the name and version of the diagnostic tool.

– Test window title

  Shows the progress of the diagnostics. "Test End" is displayed when the diagnostics completes.

– Test result

  Shows the start, end, and elapsed time and completion status of the diagnostics.

– Guide line

  Shows the details of the keys to operate window.

– Test summary window

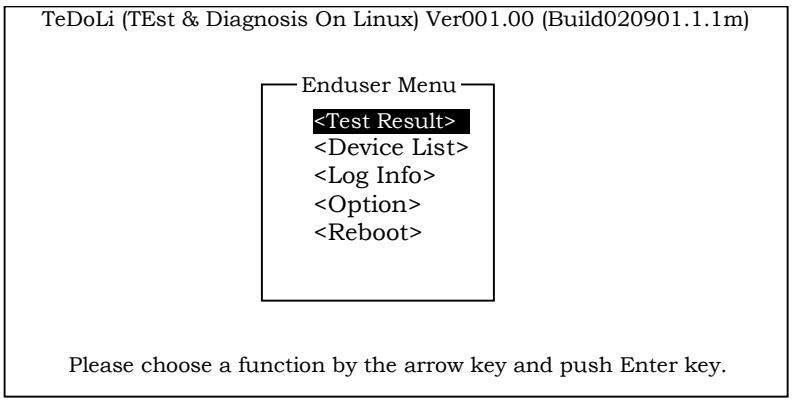
  Shows the results of each test that executed the diagnostics. Move the cursor and press the **Enter** key on the cursor line to display the details of the test.

When an error is detected by the system diagnostics, the relevant test result in the test Summary window is highlighted in red, and "Abnormal End" is displayed in the result on the right side.

Move the cursor to the test that detected the error, and press the **Enter** key. Record the error message that has been output to the Detail Information screen and contact your service representative.

7. Follow the guide line shown at the bottom of the screen, and press the **Esc** key.

   The [Enduser Menu] below is displayed.



<Test Result> Shows the diagnostics completion screen of the above diagnostics.

<Device List> Shows a list of connected devices.

<Log Info> Shows the log information of the diagnostics. It can be saved on a floppy disk.
To save it on a floppy disk, insert a formatted floppy disk to the floppy disk drive, and select <Save(F)>.

<Option> Runs the various optional menu.

<Reboot> Reboots the system.

8. Select <Reboot> in the [Enduser Menu] above.

   The server restarts and the system is started from the NEC EXPRESSBUILDER.

9. Exit the NEC EXPRESSBUILDER, and remove the CD-ROM from the DVD-ROM drive.

10. Power off the server and unplug the power cord from the receptacle.

11. Reconnect all the LAN cables that have been disconnected in Step 2 to the server.

12. Plug in the power cord.

This completes the system diagnostics.

RELOCATING/STORING THE SERVER

Follow the procedure below to relocate or store the server:

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Never attempt to lift the server only by yourself.
- Do not install the server in any place other than specified.
- Do not connect/disconnect any interface cable with the power cord of the server plugged to a power source.

IMPORTANT:

- If the server needs to be relocated/stored due to a change in the floor layout to a great extent, contact the service representative.
- Make sure to make a backup copy of your valuable data in the hard disk drive, if any.
- Make sure not to apply a shock to hard disk drives to relocated the server if the contains any.

1. Take a media out of the server, if any.
2. Power off the server (the POWER/SLEEP LED goes off).
3. Unplug the power cord of the server from a power outlet.
4. Remove all the cables from the server.
5. Hold the server by its bottom with at least three persons to carry the server.

IMPORTANT: Do not hold the front door to lift the server. The front door may be disengaged from the server, causing personal injury.

6. Protect the server with the shock-absorbing materials, and pack it securely.

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Chapter 8

Troubleshooting

If your server does not operate as expected, read this chapter before assuming a failure.

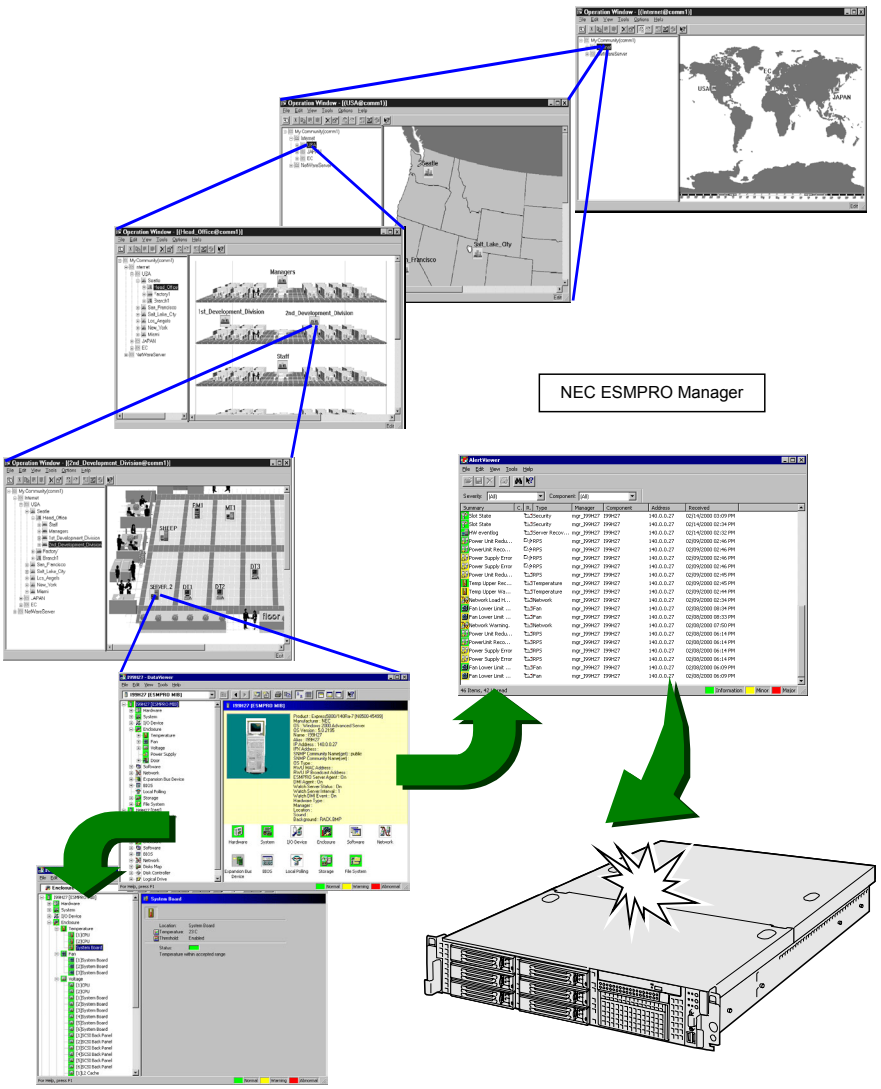
> **NOTE:** For provision against an unexpected failure, it is recommended to install the maintenance utility, NEC ESMPRO, to the server and client computers.

SYSTEM VIEWERS

Monitor the occurrence of fault by NEC ESMPRO during the system operation.

Especially take note on whether any alert is reported to NEC ESMPRO Manager on the management PC. Check whether any alert is reported on the Operation Window, Data Viewer, or Alert Viewer of NEC ESMPRO Manager.

[Example]



LEDS

The server includes LEDs to indicate the server states by a variety of colors and display patterns on the front panel, hard disk drive, and power supply.

Chapter 2 "Status Indicators" lists the LED displays and their meanings and the actions taken at occurrences of failures.

ERROR MESSAGES

If an error occurs in the server, an error message appears on the display unit connected to the server.

Error Messages after Power-on

Powering on the server automatically starts the self-diagnostic program, POST (Power On Self-Test). When the POST detects any error, it displays an error message and its measure on the display unit.

Follow the table below to troubleshoot such errors. However, even when there is no hardware failure, use of the keyboard or mouse at the following timing causes the POST to assume a keyboard controller error and stop processing.

- Immediately after the server is powered
- Immediately after the system is rebooted in response to a keyboard instruction (simultaneous key entry of **Ctrl** + **Alt** + **Delete**)
- Immediately after the system is rebooted in response to an OS instruction
- During hardware initialization following restart of the POST

When the POST detects a hardware failure due to the above reason, restart the server once again. If the same error message reappears, you may assume there is no hardware error. To ensure normal operation of the server, however, make sure to follow the following restrictions.

- Do not make any keyboard entry or use the mouse before the memory count appears on the screen following the server power-on.
- Do not make any keyboard entry or use the mouse before the start-up message of the SCSI Configuration Utility appears on the screen following the server reboot.

> **IMPORTANT:** Take a note on the on-screen message before contacting your service representative. The alarm indication would be a great help for maintenance.

POST Error Messages

When POST detects an error, it displays an error message on the display unit screen. The following table lists error messages and actions to take.

> **IMPORTANT:** Take a note on the messages displayed before consulting with your service representative. Alarm messages are useful information for maintenance.

Error code	Error message	Recommended Action
0200	Failure Fixed Disk.	Contact your service representative.
0210	Stuck Key.	Disconnect the keyboard and connect it again.
0211	Keyboard error	Disconnect the keyboard and connect it again. If the error cannot be corrected, contact your service representative.
0213	Keyboard locked - Unlock key switch.	Release the lock of the key switch. If the error cannot be corrected in spite of the release of the lock, contact your service representative.
0220	Monitor type does not match CMOS - Run SETUP.	Start the SETUP. If the error cannot be corrected in spite of the start of SETUP, contact your service representative.
0230	System RAM Failed at offset.	Contact your service representative.
0231	Shadow Ram Failed at offset.	
0232	Extended RAM Failed at address line.	
0250	System battery is dead - Replace and run SETUP.	Contact your service representative to replace the battery. (After restarting the computer, start the SETUP to provide the setting again.)
0251	System CMOS checksum bad - Default configuration used.	The default values have just been set. Start the SETUP to provide the setting again. If the error cannot be corrected, contact your service representative.
0252	Password checksum bad - Passwords cleared.	The password has just been cleared. Start the SETUP to provide the setting again.
0260	System timer error.	Start the SETUP to set the date and time again. If the same error occurs successively in spite of the resetting, contact your service representative.
0270	Real time clock error.	
0271	Check date and time setting.	

Error code	Error message	Recommended Action
02D1	System Memory exceeds the CPU's caching limit.	Contact your service representative.
02F4	EISA CMOS not write able.	
02F5	DMA Test Failed.	
02F6	Software NMI Failed.	
02F7	Fail-safe Timer NMI Failed.	
0B22	Processors are installed out of order.	Request the maintenance to replace the CPU.
0B28	Unsupported Processor detected on Processor 1.	Make sure that the server supports the CPU. If you are not sure, contact your service representative to request the maintenance.
0B29	Unsupported Processor detected on Processor 2.	
0B30	FAN1 Alarm occurred.	Clean the internal cooling fans. Contact your service representative to replace the fan.
0B31	FAN2 Alarm occurred.	
0B32	FAN3 Alarm occurred.	
0B33	FAN4 Alarm occurred.	
0B34	FAN5 Alarm occurred.	
0B35	FAN6 Alarm occurred.	
0B36	FAN7 Alarm occurred.	
0B37	FAN8 Alarm occurred.	
0B42	Resource Conflict	Contact your service representative.
0B43	Warning: IRQ not configured	
0B45	System configuration Data Write Error	
0B5F	Forced to use Processor with error	Because an error is detected in every CPU, the system is forcibly started. Contact your service representative.
0B60	DIMM group #1 has been disabled	Contact your service representative.
0B61	DIMM group #2 has been disabled	
0B62	DIMM group #3 has been disabled	
0B63	DIMM group #4 has been disabled	
0B64	DIMM group #5 has been disabled	
0B65	DIMM group #6 has been disabled	
0B70	The error occurred during temperature sensor reading.	Contact your service representative.
0B71	System Temperature out of the range.	Contact your service representative to replace the fan.
0B74	The error occurred during voltage sensor reading.	Contact your service representative.
0B75	System voltage out of the range.	
0B80	BMC Memory Test Failed.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B81	BMC Firmware Code Area CRC check failed.	
0B82	BMC core Hardware failure.	
0B83	BMC 1BF or 0BF check failed.	
0B8A	BMC SEL area full	Clear the system event logs by using the BIOS SETUP utility (see Chapter 4).
0B8B	BMC progress check timeout.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B8C	BMC command access failed.	
0B8D	Could not redirect the console - BMC Busy -	
0B8E	Could not redirect the console - BMC Error -	

Error code	Error message	Recommended Action
0B8F	Could not redirect the console - BMC Parameter Error -	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B90	BMC Platform Information Area corrupted.	
0B91	BMC update firmware corrupted.	
0B92	Internal Use Area of BMC FRU corrupted.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B93	BMC SDR Repository empty.	Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B94	IPMB signal lines do not respond.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B95	BMC FRU device failure.	This is not a fatal error. Turn off the power once and then on again to restart the server. If the error cannot be corrected, contact your service representative.
0B96	BMC SDR Repository failure.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B97	BMC SEL device failure.	
0B98	BMC RAM test error.	
0B99	BMC Fatal hardware error.	
0B9A	Management controller not responding.	Update the RMC firmware. If the error cannot be corrected, contact your service representative.
0B9B	Private I2C bus not responding.	Turn off the power once and then on again to start the server. If the error cannot be corrected, contact your service representative.
0B9C	BMC internal exception.	
0B9D	BMC A/D timeout error.	
0B9E	SDR repository corrupt.	
0B9F	SEL corrupt.	
0BB0	SMBIOS – SROM data read error.	Contact your service representative.
0BB1	SMBIOS – SROM data checksum bad.	
8100	Memory Error detected in DIMM group #1.	Contact your service representative to replace the DIMM in the relevant group.
8101	Memory Error detected in DIMM group #2.	
8102	Memory Error detected in DIMM group #3.	
8103	Memory Error detected in DIMM group #4.	
8104	Memory Error detected in DIMM group #5.	
8105	Memory Error detected in DIMM group #6.	
8160	Mismatch Processor speed detected on Processor 1.	Contact your service representative.
8161	Mismatch Processor speed detected on Processor 2.	

Error code	Error message	Recommended Action
None	Expansion ROM not initialized – PCI Mass Storage Controller in slot n (n: slot number)	Disable initialization of the optional device expansion ROM by using the BIOS SETUP utility (see Chapter 4).
	H/W Configuration of BMC is corrupted. !! Update BMC F/W Configuration by configuration tool !! !! Refer to BMC configuration manual !!	Use the NEC EXPRESSBUILDER to configure the remote management card (see Chapter 6).

Beep Codes

If an error occurs during the POST, the server beeps, indicating the type of error.

Each number indicates the number of short beeps, and a hyphen indicates a pause. For example, the beep interval 1-5-2-2 indicates 1 beep, pause, 2 beeps, pause, 2 beeps, pause, and 3 beeps notifying that no processor is detected on the mother board.

Beep code	Description	Recommended action
1-2	Option ROM initialization error	1. Check if the optional add-in card is properly installed. 2. Run the BIOS SETUP utility to check the IRQ assignment. 3. Ask your service representative to replace the add-in card or mother board.
3-3	ROM checksum error	Replace the mother board.
1-2-2-3		
1-3-1-1	DRAM refresh test error	1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board.
1-3-1-3	Keyboard controller error	1. Check if the keyboard is properly connected. 2. Replace the mother board.
1-3-3-1	No memory or capacity check error	1. Check if the DIMM is properly installed. 2. Remove the DIMM once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed DIMM or mother board.
1-3-4-1	DRAM address error	
1-3-4-3	DRAM test Low Byte error	
1-4-1-1	DRAM test High Byte error	
1-5-1-1	CPU startup error	1. Check if the CPU is properly installed. 2. Remove the CPU once, and then re-install it to check if it operates normally. 3. Ask your service representative to replace the failed CPU.
1-5-2-1	No CPU installed	
1-5-4-4	Abnormal voltage	
2-1-2-3	BIOS ROM copyright test error	Replace the mother board.
2-2-3-1	Unexpected interrupt test error	

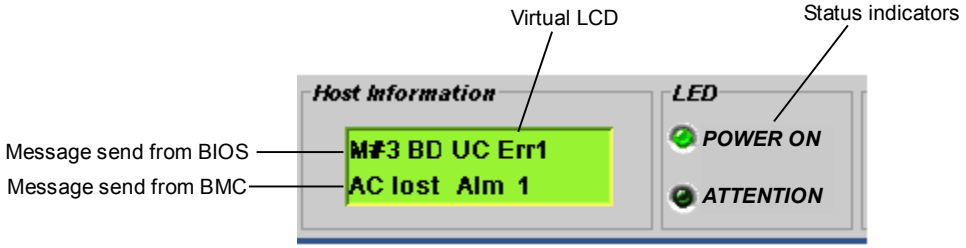
Error Messages on Virtual LCD

NEC EXPRESSSCOPE Engine (Remote Management Controller) on your server board allows you to monitor the server status on the WEB browser-based screen of the client PC via network.

The virtual LCD (16 digits x 2 lines) in the "Host Information" area displays the POST codes and status message.

When POST detects an error, the POST error code is displayed on the virtual LCD upon completion of POST. See the table for POST error codes for details.

Example:



Messages displayed on upper line (BIOS message)

On-screen message	Description	Action
XX BIOS Rev YYYY	POST in progress. XX: POST code, YYYY: BIOS version	This is not an error.
CPU Reconfigured	POST completes with processor degraded.	Contact your service representative. Try the following steps to cancel the error. 1. Start BIOS SETUP. 2. Select [Main] - Processor Settings] - [Processor Retest] - [Yes]. 3. Select [Exit] - [Exit Saving Changes].
Mem Reconfigured	POST completes with memory degraded.	Contact your service representative. Try the following steps to cancel the error. 1. Start BIOS SETUP. 2. Select [Advanced] - [Memory Configuration] - [Memory Retest] - [Yes]. 3. Select [Exit] - [Exit Saving Changes].

On-screen message	Description	Action
Memory C-Err XX	A correctable error frequently occurs in DIMM #XX.	Contact your service representative.
Memory U-Err XX	An uncorrectable error has occurred in DIMM #XX.	
PCI Bus PERR XX	A PERR has occurred in the PCI bus XX.	
PCI Bus SERR XX	A SERR has occurred in the PCI bus XX.	
Prepare To Boot	POST completes normally.	This is not an error.

Messages displayed on lower line (BMC message)

When the following messages are displayed on the virtual LCD, restart your server by turning off and on. If an error still occurred, contact your service representative for maintenance.

On-screen message	Description
240VA Power Down	Power supply failure occurred.
BB +1.5v Alm XX	Voltage alarm occurred on the mother board. XX=09: high voltage (fetal) XX=07: high voltage (warning) XX=02: low voltage (warning) XX=00: low voltage (fetal)
BB +1.8v Alm XX	
BB +3.3v Alm XX	
BB +5.0v Alm XX	
BB +12v Alm XX	
BB P_Vtt Alm XX	
BB Temp1 Alm XX	Mother board thermal error occurred. XX=09: high voltage (fetal) XX=07: high voltage (warning) XX=02: low voltage (warning) XX=00: low voltage (fetal)
DUMP Request !	Dump switch is pressed.
OS shutdown Alm	OS shutdown alarm occurred.
Power On Cnt Alm	Power supply failure occurred.
Power Unit 1 Alm	Power unit #1 Failure occurred.
Power Unit 2 Alm	Power unit #2 Failure occurred.
Proc Missing	Processor is not found.
Proc 1 T-Trip	Thermal Trip occurred on processor #1 or #2. The system is forcibly turned off.
Proc 2 T-Trip	
Proc1 Therm % XX	Processor #1 or #2 thermal error occurred. XX=09: high temperature (fetal) XX=07: high temperature (warning) XX=02: low temperature (warning) XX=00: low temperature (fetal)
Proc2 Therm % XX	
Proc1 VccpAlm XX	Voltage alarm occurred on processor #1 or #2. XX=09: high voltage (fetal) XX=07: high voltage (warning) XX=02: low voltage (warning) XX=00: low voltage (fetal)
Proc2 VccpAlm XX	
Processor 1 IERR	IERR occurred on processor #1 or #2.

On-screen message	Description
Processor 2 IERR	
SMI timeout	SMI timeout occurred.
Sys Fan 1 Alarm	FAN#1 alarm occurred.
Sys Fan 2 Alarm	FAN#2 alarm occurred.
Sys Fan 3 Alarm	FAN#3 alarm occurred.
Sys Fan 4 Alarm	FAN#4 alarm occurred.
Sys Fan 5 Alarm	FAN#5 alarm occurred.
Sys Fan 6 Alarm	FAN#6 alarm occurred.
Sys Fan 7 Alarm	FAN#7 alarm occurred.
Sys Fan 8 Alarm	FAN#8 alarm occurred.
VBAT Alm XX	Voltage alarm in lithium battery occurred. XX=09: high voltage (fetal) XX=07: high voltage (warning) XX=02: low voltage (warning) XX=00: low voltage (fetal)
WDT timeout	Watchdog timer timeout error occurred.

SOLVING PROBLEMS

When the server fails to operate as expected, see the following to find out your problem and follow the instruction given before asking for repair.

If the server still fails to operate successfully after solving your problem, take a note on the on-screen message and contact your service representative.

Problems with the Server

Fail to power on the server:

- ❑ Is the server is properly supplied with power?

  → Check if the power cord is connected to a power outlet (or UPS) that meets the power specifications for the server.

  → Make sure to use the power cord provided with the server. Check the power cord for broken shield or bent plugs.

  → Make sure the power breaker for the connected power outlet is on.

  → If the power cord is plugged to a UPS, make sure the UPS is powered and it outputs power. See the manual that comes with the UPS for details.

  Power supply to the server may be linked with the connected UPS using the BIOS setup utility of the server.

  <Menu to check: [Server] - [AC-LINK]>

- ❑ Did you press the POWER switch?

  → Press the POWER switch on the front of the server to turn on the power (the POWER LED lights).

Fail to power off the server:

- ❑ Is the POWER switch enabled?

  → Restart the server and start the BIOS setup utility.

  <Menu to check: [Security] - [Power Switch Inhibit]>

- ❑ Is the server running in the Secure Mode?

  → The POWER switch is disabled in the Secure Mode. (Forced shutdown is also not available.) To release the Secure Mode, enter the password specified with the BIOS SETUP utility.

No screen display appears with beep:

→ Check whether DIMMs are connected to the mating connectors firmly.

→ Check whether DIMMs of different specifications are installed in the specific bank. See Chapter 9 for the specifications of DIMMs.

→ DIMMs must be populated in pairs and in the following order:
11 and 21, 31 and 41, 12 and 22, 32 and 42, 13 and 23, and 33 and 43.

→ Installed DIMMs must be the same speed and must all be registered.

→ Take a note of beep code pattern, and take appropriate action according to the table listed earlier in "Beep Codes".

POST fails to complete:

❑ Is the DIMM board installed?

→ At least two DIMM boards are required for operation.

→ DIMMs must be populated in pairs and in the following order:
11 and 21, 31 and 41, 12 and 22, 32 and 42, 13 and 23, and 33 and 43.

→ Installed DIMMs must be the same speed and must all be registered.

❑ Is the memory size large?

→ The memory check may take a few seconds if the memory size is large. Wait for a while.

❑ Did you perform any keyboard or mouse operation immediately after you started the server?

→ If you perform any keyboard or mouse operation immediately after start-up, POST may accidentally detect a keyboard controller error and stops proceeding. In such a case, restart the server once again. Do not perform any keyboard or mouse operation until the BIOS start-up message appears when you restart the server.

❑ Does the server have contains appropriate memory boards or PCI devices?

→ Operation of the server with unauthorized devices is not guaranteed.

Fail to access to internal or external devices (or such devices fail to operate):

- ❑ Are cables properly connected?

  → Make sure that the interface cables and power cord are properly connected. Also make sure that the cables are connected in the correct order.

- ❑ Is the power-on order correct?

  → When the server has any external devices connected, power on the external devices first, then the server.

- ❑ Did you install drivers for connected optional devices?

  → Some optional devices require specific device drivers. Refer to the manual that comes with the device to install its driver.

- ❑ Is BIOS configuration correct?

  → When the server has PCI devices connected, make sure to set the PCI device interrupt and others with the BIOS SETUP utility of the server. (Most PCI devices generally do not require any change to the configuration, but some boards do require specific settings. Refer to the manual that comes with the board for details to make correct settings.

  <Menus to check: [Advanced] - [PCI Configuration] - [PCI Slot xx ROM]
  x: PCI slot number>

  → Some devices connected to the serial or parallel port may require I/O port address or operation mode settings. Refer to the manual that comes with the board for details to make correct settings.

  <Menu to check: [Advanced] - [Peripheral Configuration]>

The POWER switch and sleep feature are disabled:

- ❑ Is the POWER switch masked by the BIOS feature?

  → The BIOS can disable power-off with the POWER switch after the operating system is started (including shutdown by pressing the POWER switch for at least four seconds).
  Run the BIOS SETUP utility to change settings (see Chapter 4).

The keyboard or mouse fails to operate:

- ❑ Is the cable properly connected?

  → You must use the provided keyboard/mouse branch cable (Y cable) for this server. Make sure that the provided cable is connected to the correct connector on the rear of the server.

  → The keyboard or mouse does not operate if it is connected when the server is powered (not applicable to USB devices). Power of the server first and connect it properly.

- ❑ Is BIOS configuration correct?

  → The keyboard and mouse may be disabled with the BIOS SETUP utility of the server. Check the settings with the BIOS SETUP utility.

  <Menus to check: [Advanced] - [Numlock]>

- ❑ Are the server drivers installed?

  → Refer to the manual that comes with your OS to check that the keyboard and mouse drivers are installed. (These drivers are installed along with the OS.) Some OS's allow you to change the keyboard and mouse settings. Refer to manual that comes with your OS to check that the keyboard and mouse settings are correct.

Fail to access to the disc:

- ❑ Is the disc properly set in the DVD-ROM drive tray?

  → The tray is provided with a holder to secure the disc. Make sure that the disc is placed properly in the holder.

- ❑ Is the disc applicable to the server?

  → The disc for Macintosh is not available for use.

- ❑ Is the CD/FDD bay installed correctly?

  → Reinstall the CD/FDD bay (see Chapter 9).

Inserted the correct disc but the message like the following is displayed:

```
The CD-ROM is not inserted or the wrong CD-ROM is inserted.
Please insert the correct CD-ROM.
OK
```

- ❑ Is the data side of the disc dirty or injured?

  → Take the disc out of the DVD-ROM drive, confirm that it is not dirty or injured, reset and click [OK].

Fail to access the hard disk drive:

(Refer to the documentation supplied with the disk array controller.)

- ❑ Is the hard disk drive applicable to the server?

  → Operation of any device that is not authorized by NEC is not guaranteed.

- ❑ Is the hard disk drive properly installed?

  → Make sure to lock the hard disk drive with the lever on its handle. The hard disk drive is not connected to the internal connector when it is not completely installed (see Chapter 9).

Fail to access the (internal or external) SCSI devices:

- ❑ Is the SCSI device applicable to the server?

  → Operation of any SCSI device that is not authorized by NEC is not guaranteed.

- ❑ Are SCSI devices properly configured?

  → When the server has external SCSI devices connected, hard disk drive settings, including SCSI ID and terminator, are required. Refer to the manual that comes with the SCSI device for details.

- ❑ Are the SCSI controllers (including optional controllers) properly configured?

  → Use the SCSI BIOS setup utility for proper configuration of SCSI devices connected to the SCSI connector on the mother board. When the server has an optional SCSI controller installed and SCSI devices connected to it, use the SCSI BIOS setup utility that comes with the optional SCSI controller for proper configuration. See the manual that comes with the optional SCSI controller for details.

The server is not found on the network:

- ❑ Is the LAN cable connected?

  → Make sure to connect the LAN cable to the network port on the rear of the server. Also make sure that the LAN cable to use conforms with the network interface standard.

- ❑ Is BIOS configuration correct?

  → The internal LAN controller may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS SETUP utility.

  <Menus to check:

  [Advanced] - [PCI Configuration] - [Onboard LAN] - [LAN Controller]>

- ❑ Have the protocol and service already configured?

  → Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.

- ❑ Is the transfer speed correct?

  → Open the network property dialog box in control panel to specify the "Link Speed & Duplex" value the same as the value specified for HUB.

Wake on LAN does not start from standby state.

- ❑ Is Hub set to Auto-Negotiation? Or, Is the client set to Auto-Negotiation/optimum speed?

  → For both hub and client, Wake on LAN does not start from the standby state if the speed is fixed to 1000Mbps.

Problems with Disk Array Configuration

Check the following if the server configuring a disk array does not operate properly or a utility does not operate correctly. If a relevant item is found, follow the processing method.

Fail to display the BIOS banner to run the utility:

- ❑ Is the mother board configured?

  → Change the RAID configuration jumper on the mother board (see Chapter 4).

Fail to install the OS:

- ❑ Is the disk array controller configured?

  → Provide proper configuration for the disk array controller by using the SoftwareRAID Setup Utility (see Chapter 4).

Fail to start the OS:

- ❑ Is the BIOS of the disk array controller changed?

  → Change the RAID configuration jumper on the mother board (see Chapter 4).

- ❑ Does POST recognize the disk array controller?

  → After making sure that the disk array controller is connected correctly, then power on the server.

  → The disk array controller on the mother board may be failed. Contact your service representative.

Rebuild fails:

- ❑ Is the capacity of the hard disk drive to be rebuilt sufficient?

  → The hard disk drive to be rebuilt should have the same capacity of the failed had disk drive.

- ❑ Is RAID0 configured?

  → RAID0 has no data redundancy, therefore, Rebuild is disabled in the RAID0 configuration. Replace the failed hard disk drive, create the configuration data again and initialize the hard disk drives. Then recover the data by using backup data.

Auto rebuild fails:

- ❑ Was a sufficient time taken for hot swap of hard disk drives?

  → To allow the auto rebuild to operate correctly, it should take 90 seconds or longer for the interval between the removal of the failed hard disk drive and the installation of a new hard disk drive.

- ❑ Is configuration correct?

  → Check the setting of auto rebuild by using the SoftwareRAID Setup Utility. <Menus to check: Top menu - [Objects] - [Adapter] - [Auto Rebuild]>

A hard disk drive fails:

→ Contact your service representative.

Problems with Windows Server 2003 x64 Editions

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions.

Source:	DCOM
Category:	Error
Event ID:	10016
Description:	The application-specific permission settings do not grant Local Activation permission for the COM server application with CLSID {555F3418-D99E-4E51-800A-6E89CFD8B1D7} to the user {NT AUTHORITY\LOCAL SERVICE} SID {S-1-5-19}. This security permission can be modified using the component Services administrative tool.

→ It is not a problem in operating the system.

There are some cases that an event log is registered as follows when you install Windows Server 2003 x64 Editions.

Event Source:	Service Control Manager
Event Type:	Error
Event ID:	7011
Description:	Timeout (30000 milliseconds) waiting for a transaction response from the IMAP4Svc service.

→ When this event is not registered by rebooting the system, it is not a problem in operating the system.

Problems with Windows Server 2003 R2

There are some cases that an event log is registered as follows when you operate Windows Server 2003 R2.

Source: IPMIDRV

Type: Error

Event ID: 1001

Description: The IPMI device driver attempted to determine if the system supported an IPMI BMC device. The driver attempted to detect the presence of the IPMI BMC by searching the SMBIOS for Type 38 record. But either no record was found or the record was not compatible with the version of the device driver.
If a SMBIOS Type 38 record was detected, the Dump Data field of the event contains a binary representation of the record.

→ If you use "Hardware Management" which is provided by Windows Server 2003 R2, above-shown event log will be registered.

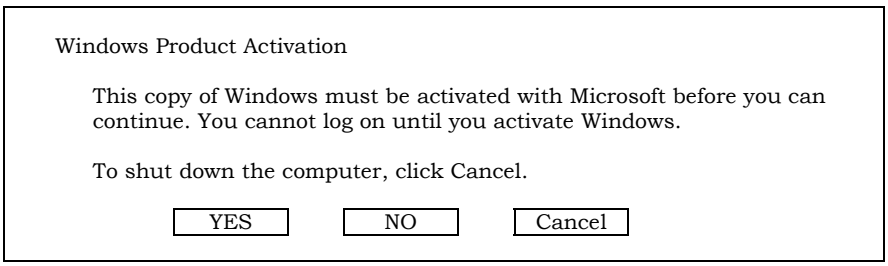
For more details, refer to "Enabling Microsoft Windows Server 2003 R2 Hardware Management" on the following site.

[NEC Express5800 Web Site]

http://www.nec.co.jp/express/download/W2K3_R2

Problems with Windows Server 2003

The system displays the message below and fails to log on.


Windows Product Activation
This copy of Windows must be activated with Microsoft before you can continue. You cannot log on until you activate Windows.
To shut down the computer, click Cancel.
YES
NO
Cancel

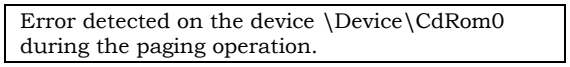
→ In Windows Server 2003, the above message will be displayed if you use the operating system without executing the license authentication. Select "Yes", and execute the procedure for license authentication.

Cannot install the operating system correctly.

❑ Did you confirm the notes on installing the operating system?

→ See Chapter 6.

During installation, the following warning is registered in the System Log of the Event Viewer:



→ There is no problem on this issue.

Fail to start the OS:

❑ Is a floppy disk in the floppy disk drive?

→ Take out the floppy disk and restart the server.

❑ Is the NEC EXPRESSBUILDER CD-ROM in the DVD-ROM drive?

→ Take out the NEC EXPRESSBUILDER CD-ROM and restart the server.

❑ Is the OS broken?

→ Use recovery process to recover the system.

The OS presents unstable operation:

❑ Did you update the system?

→ Installing a network drive after installation of the OS may cause unstable operation. Use the NEC EXPRESSBUILDER CD-ROM to update the system. (See Chapter 6.)

The system does not restart automatically when a stop error occurs, though the system is adjusted to automatically restarting:

→ When the system does not restart automatically, restart it manually.

The system restarts automatically when a stop error occurs, though the system is NOT adjusted to automatically restarting:

→ There is no problem about this issue.
Check the System Event Log to confirm that STOP error occurred.

Cannot turn the power OFF at the blue screen:

→ If you want to turn off the power at the blue screen, execute forced shutdown (forced shutdown: continue to press POWER/SLEEP switch for 4 seconds). The power will not be turned off if you press the switch for less than 3 seconds.

The PXE boot (network boot) fails or the server is not found on the network:

- ❑ Is the cable connected properly?

  → Connect the proper cable to the network port on the rear of the Express server. In addition, make sure that the used cable conforms to the network interface standard.

- ❑ Is BIOS configuration correct?

  → The internal LAN controller may be disabled with the BIOS SETUP utility of the server. Check the setting with the BIOS setup utility.

- ❑ Have the protocol and service already configured?

  → Install the distinctive network driver for the server. Make sure that the protocol, such as TCP/IP, and services are properly specified.

- ❑ Is the transfer speed correct?

  → Open the network property dialog box in control panel to specify the link speed and duplex value the same as the value specified for HUB.

The Telnet Service is not installed.

→ Adjust the computer name to 14 characters or less, and then install the Telnet Service according to <How to install the Telnet Service>.

<How to install the Telnet Service>

1. Click [Run] on Start menu.
2. Type "tlntsvr /service" in the [Open] box, and click [OK].
3. Click Start menu, point to [Control Panel] and click [Computer Management] and then click the [Services] to specify whether the Telnet Service is registered.

   * When the installation of Telnet Service is finished, there is no problem if the computer name is set to 15 characters or more.

Problems with NEC EXPRESSBUILDER

When the server is not booted from the NEC EXPRESSBUILDER CD-ROM, check the following:

- ❑ Did you set the NEC EXPRESSBUILDER during POST and restart the server?

  → If you do not set the NEC EXPRESSBUILDER during POST and restart the server, an error message will appear or the OS will boot.

- ❑ Is BIOS configuration correct?

  → The boot device order may be specified with the BIOS SETUP utility of the server. Use the BIOS SETUP utility to change the boot device order to boot the system from the DVD-ROM drive first.

  <Menu to check: [Boot]>

- ❑ Is an error message appeared?

  → When an error occurs while the NEC EXPRESSBUILDER is in progress, the following message appears. After this message appears, check the error and take the appropriate corrective action according to the message listed in the table below.

Message	Cause and Remedy
This machine is not supported.	This NEC EXPRESSBUILDER version is not designed for this server. Execute the NEC EXPRESSBUILDER on the compliant server.
Hard disk access error	The hard disk drive is not connected or it is failed. Check whether the hard disk drive is correctly connected.
NvRAM access error	An access to the nonvolatile memory (NvRAM) is not acceptable.
The system-specific information does not exist on the baseboard. Please restore the backup data or write the data by using [System Information Management] of the Off-line Maintenance Utility. Only the authorized personnel are allowed to do this operation.	The system-specific information can't be acquired in the mother board exchange and so on.

Problems with Express Setup

Express Setup can not be used

→ Express Setup does not support the installation of Microsoft Windows Server 2003 x64 Editions.
If you want to perform re-setup, see Appendix D and perform "Manual Setup".

Following message appeared when you tried to install Express Setup to the hard disk drive that has smaller capacity than the specified partition size:

```
The specified partition size has exceeded the capacity of the hard disk.
The setup created the partition at the maximum size that can be reserved on the hard disk.
Setup will continue the process.
OK
```

→ It is not an abnormal condition. Press **Enter** to continue the installation.

The message can not be displayed correctly when copying the files from CD-ROM or checking CD-ROM:

→ Press **R**. When the message appears again even if you press **R**, restart the Express Setup from the beginning. In case the same result occurred after the restart of installation, contact Maintenance Service Company and ask them to check the DVD-ROM drive.

Express Setup terminated and asks to input setup information.

→ There are some errors on the specified setup information.
Follow the instruction to input the correct value. It is not necessary to cancel the installation.

[OK] appears on the [Role of Computer] screen.

→ If you click [OK] here, the setup will select the default value of Express Setup for the later specification to continue the process.

<The Default Value for Windows Server 2003>

The specification of network protocol

Protocol :	TCP/IP[DHCP Specified]
Service :	Select sharing Microsoft network files and printer.
Client :	Microsoft network client.
Component :	SNMP
Application :	NEC ESMPRO Agent
	MegaRAID Storage Manager (When disk array system)
	Power Console Plus (When disk array system)

[OK] does not appear on [Role of Computer] screen.

→ The [OK] does not appear if the Setup File that has already been created is loaded.

→ [OK] appears only when you first entered the [Role of Computer] screen. Once you go to the next screen from [Role of Computer], the [OK] will not appear even if you click [Back] to go back to the [Role of Computer] screen.

Select [Use Existing Partition] at [System Partition], but the OS is installed in the whole area of the disk.

→ Is there any other partition than the partition to re-use (excluding maintenance area)? If the partition other than the one to re-use does not exist, the setup will reserve the whole area of the disk to install operating system.

Specified to join the Domain, but the system is installed as Workgroup.

→ When the setup fails to join the Domain during the installation, it will install the system as Workgroup. Open [System] in Control Panel to specify joining the Domain.

Entered the incorrect Product ID/CD key.

→ Even if you entered the incorrect Product ID/CD key, Express Setup will start. However, the setup will stop and asks you to re-enter the correct value. Also in this case, input request will occur when rebooting after GUI setup completed during Express Setup. If these 2 inputs are done correctly, there is no problem on Windows setup.

Unable to specify the details of Network adapter.

→ In Express Setup, you can not specify the details of Network adapter. Specify them from Control Panel after starting Windows.

Connected more than two Network adapter and specified different protocol for each adapter, but all the protocols are specified on either adapter.

→ It's a design. Each adapter is specified so that all the installed protocols can be used. The value that can not be specified during Express Setup will all be specified by default value.

When more than two Network adapter are specified, the detailed specification of TCP/IP protocol are all set to use DHCP.

→ When more than two Network adapter are specified, the detailed specification of the protocol may all be set by default value. Re-specify the details from Control Panel.

Not more than two Network adapter is connected, but the detailed specification of the protocol are all set by default.(e.g. Specified IP Address on TCP/IP, but DHCP is specified)

→ Are you specifying more than two protocols?
In this case, the situation will be the same as connecting more than two Network adapter, so the detailed specification of the protocol are all set by default.
Re-specify the details from Control Panel after starting the OS.

Problems with Master Control Menu

The master control menu fails to appear:

- ❑ Is your system Windows NT 4.0 or later, or Windows 95 or later?

  → The menu is only able to run on Windows NT 4.0 (or later) or Windows 95 (or later).

- ❑ Is **Shift** pressed?

  → Setting the CD-ROM with **Shift** pressed down cancels the Autorun feature.

- ❑ Is the system in the proper state?

  → The menu may not appear depending on the system registry setting or the timing to set the CD-ROM. In such a case, start the Explorer and run \MC\1ST.EXE in the CD-ROM.

Problems with Configuration Diskette Creator

The bit map of the Configuration Diskette Creator window is not displayed correctly during setting of setup information. (When the Trekking command is used)

→ If the specified number of colors is fewer than 256 in the display setting, the bit map is not displayed correctly, but the setup information can be displayed correctly.

The Point to Point tunneling protocol cannot be set.

→ The protocol is not supported at present. After installation, set the protocol through Control Panel. In this case, rebooting is not necessary.

The details of a network adapter cannot be set.

→ Configuration Diskette Creator is unable to set the details of network adapters. Start Windows Server 2003, and set the details through Control Panel.

More than one network board is connected during setting of setup information, but TCP/IP cannot be set for each network.

→ Perform the installation procedure during DHCP setting. To create a temporary IP configuration, perform the installation procedure during DHCP setting, and then set TCP/IP again through Control Panel.

Problems with Disk Array Configuration

Refer to the manual that comes with the disk array controller for any trouble occurred on disk array in this system.

COLLECTING DR. WATSON DIAGNOSTIC INFORMATION

Dr. Watson collects diagnostic information related to application errors. The location to save the information can be specified as you like. For more information, refer to Chapter 5.

MEMORY DUMP

If an error occurs, the dump file should be saved to acquire necessary information.

If you saved the dump to DAT, write down that it is saved as "NTBackup" or "ARCServe" on the label. You can specify the location to save the diagnostic information as you like.. For more information, refer to "Specifying Memory Dump (Debug Information (refer to Chapter 5 for detail)".

IMPORTANT:

- Consult with your service representative before dumping the memory. Dumping the memory while the server is in the successful operation may affect the system operation.
- Restarting the system due to an error may display a message indicating insufficient virtual memory. Ignore this message and proceed. Restarting the system may result in dumping improper data.

Preparing for Memory Dumping

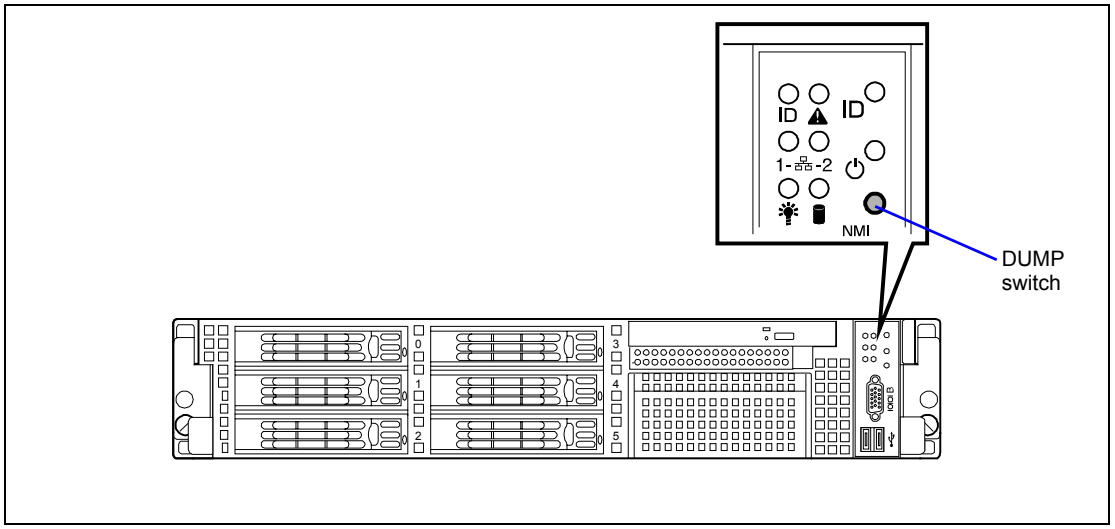
Memory dumping with the DUMP switch may disable the server to restart. In such a case, it is required to force the server to shut down. This forced shutdown, however, is not available if "Enable" is selected for "Power Switch Inhibit" on the Security menu of the BIOS setup utility, SETUP, because this setting disables POWER switch operation.

Follow the procedure below to change the setting to enable the forced shutdown and restart of the server.

1. Power on the server and start the BIOS setup utility, SETUP.
2. Select "Disable" for "Power Switch Inhibit" in the Security menu.
3. Save the configuration data and exit the SETUP.

Saving the Dump File

Press the DUMP switch to save the dump file when an error occurs. Insert a metal pin (a straightened large paper clip will make a substitute) into the switch hole to press the DUMP switch.



Pressing the DUMP switch saves the dump file in the specified directory. (Memory dumping may not be available when the CPU stalls.)

IMPORTANT: Do not use a toothpick or plastic stick that is easy to break.

OFF-LINE MAINTENANCE UTILITY

The Off-line Maintenance Utility is an OS-independent maintenance program. When you are unable to start the OS-dependent NEC ESMPRO to troubleshoot a problem, the Off-line Maintenance Utility can be used.

IMPORTANT:

- The Off-line Maintenance Utility is intended for use of your service representative. The NEC EXPRESSBUILDER CD-ROM and the Off-line Maintenance Utility Bootable FD you have created contain a file that describes operation of the utility, but do not attempt to use the utility by yourself. Contact your service representative and follow instructions.
- Starting the Off-line Maintenance Utility disables any access from a client to the server.

Starting the Off-line Maintenance Utility

The Off-line Maintenance Utility may be started in the following ways.

- From the CD-ROM

  Set the NEC EXPRESSBUILDER CD-ROM in the CD-ROM drive and reboot the system.

  After the menu is displayed on the screen, select "Tools" - "Off-line Maintenance Utility".

  The Off-line Maintenance Utility program starts from the CD-ROM.

- From the floppy disk

  Set the Off-line Maintenance Utility Bootable FD in the floppy disk drive and reboot the system.

  The Off-line Maintenance Utility program starts from the boot disk.

  The Off-line Maintenance Utility Bootable FD is created by selecting "Tools" - "Create Support FD" on the NEC EXPRESSBUILDER.

- Manual start (by pressing **F4**)

  When the Off-line Maintenance Utility is installed, press **F4** while the start-up screen of the server is on screen. The Off-line Maintenance Utility starts from the hard disk drive.

Features of Off-line Maintenance Utility

The Off-line Maintenance Utility provides the following features. (Available features vary depending on the way you started the Off-line Maintenance Utility.)

> **IMPORTANT:** See the on-line help for details of the Off-line Maintenance Utility. For further information, ask your service representative.

- IPMI Information Viewer

  Provides the functions to view the system event log (SEL), sensor data record (SDR), and field replaceable unit (FRU) and to make a backup copy of them.

  Using this feature, you can find system errors and events to determine a maintenance part.

- BIOS Setup Viewer

  Provides the functions to export the current configuration data defined with the SETUP utility to a text file.

- System Information Viewer

  Provides the functions to view information on the processor and the BIOS and export it to a text file.

- System Information Management

  Provides the function to make a back-up copy of your data.

  Without the backup data, the system-specific information and/or configuration may not be restored.

  Only the authorized personnel is allowed to restore the backup data.

- Start of Utilities

  With the NEC EXPRESSBUILDER, you can start the following utilities installed in the maintenance partition.

  – System Management

  – System Diagnostics

  – Maintenance Partition Update

- Chassis Identify

  This function can distinguish the machine with the LED or buzzer of the machine. This is convenient if you have to distinguish a machine among many machines on the rack.

RESETTING THE SERVER

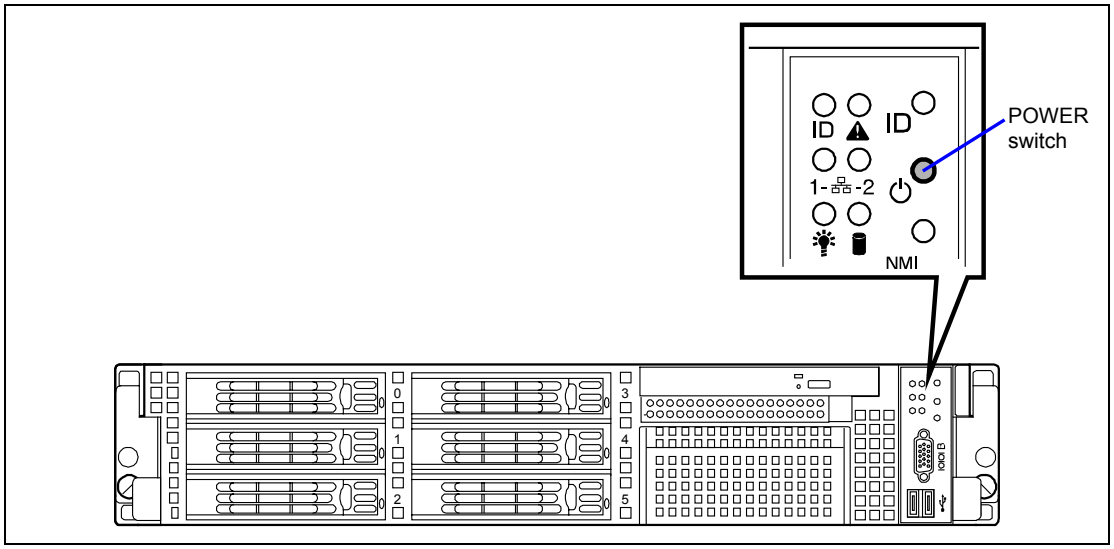
If the server halts before starting the OS, press and hold **Ctrl** and **Alt** and press **Delete**. This restarts the server.

> **IMPORTANT:** Resetting the server clears the DIMM memory and the data in process. To reset the server when it is not frozen, make sure that no processing is in progress.

FORCED SHUTDOWN

Use this function when an OS command does not shut down the server, the POWER switch does not turn off the server, or resetting does not work.

Press and hold the POWER switch on the server for at least four seconds. The power is forcibly turned off. To turn on the power back again, wait approximately 30 seconds after turning off the power (forced shutdown).



> **IMPORTANT:** If the remote power-on function is used, cycle the power once to load the OS, and turn off the power again in the normal way.

Chapter 9

Upgrading Your Server

This chapter describes internal optional devices available for the server, procedures for install or removing such optional devices, and notes on using them.

IMPORTANT:

- Optional devices described in this chapter may be installed or removed by any user. However, NEC does not assume any liability for damage to optional devices or the server or malfunctions of the server resulted from installation by the user. NEC recommends you ask your service representative for install or removing any optional devices.
- Make sure to use only optional devices and cables authorized by NEC. Repair of the server due to malfunctions, failures, or damage resulted from installing such devices or cables will be charged.
- For the Windows Server operating system user:
  When you made any change to the hardware configuration, make sure to update the system (see Chapter 5 for details.).

SAFETY NOTES

Observe the following notes to install or remove optional devices safely and properly.

⚠ WARNING

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

- Do not disassemble, repair, or alter the server.
- Do not remove the lithium battery.
- Disconnect the power plug before working with the server.

⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may cause a fire, personal injury, or property damage. See pages 1-3 to 1-8 for details.

- Do not lift the server only by a single person.
- Make sure to complete board installation.
- Do not install the server on the rack leaving the cover removed.
- Do not install the server on the rack halfway.
- Do not pinch your fingers with mechanical component.
- Avoid installation in extreme temperature conditions.

ANTI-STATIC MEASURES

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

- Wear a wrist strap (an arm belt or anti-static glove).

  Wear a wrist strap on your wrist. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

  Touch a metal part regularly when working with components to discharge static electricity.

- Select a suitable work space.
  - Work with the server on the anti-static or concrete floor.
  - When you work with the server on a carpet where static electricity is likely to be generated, make sure take anti-static measures beforehand.

- Use a work table.

  Place the server on an anti-static mat to work with it.

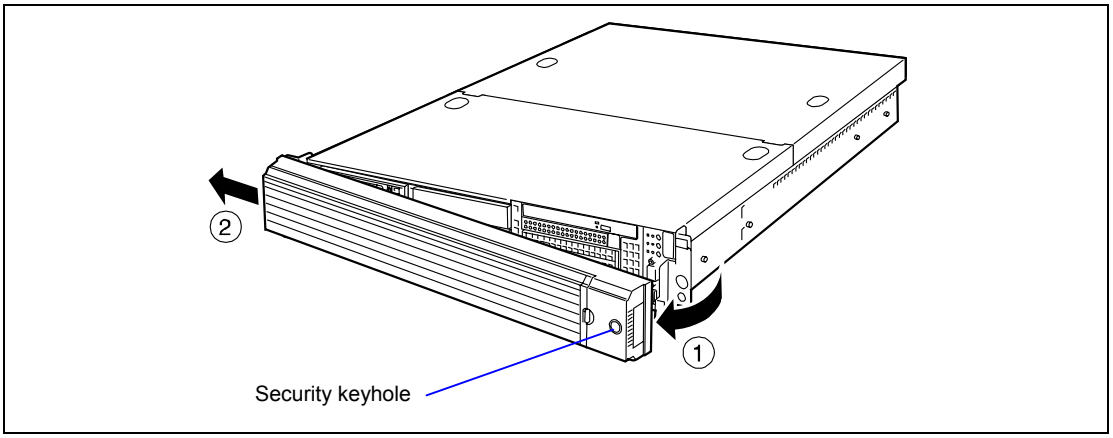
- Cloth
  - Do not wear a wool or synthetic cloth to work with the server.
  - Wear anti-static shoes to work with the server.
  - Take off any jewels (a ring, bracelet, or wrist watch) before working with the server.

- Handling of components
  - Keep any component in an anti-static bag until you actually install it to the server.
  - Hold a component by its edge to avoid touching any terminals or parts.
  - To store or carry any component, place it in an anti-static bag.

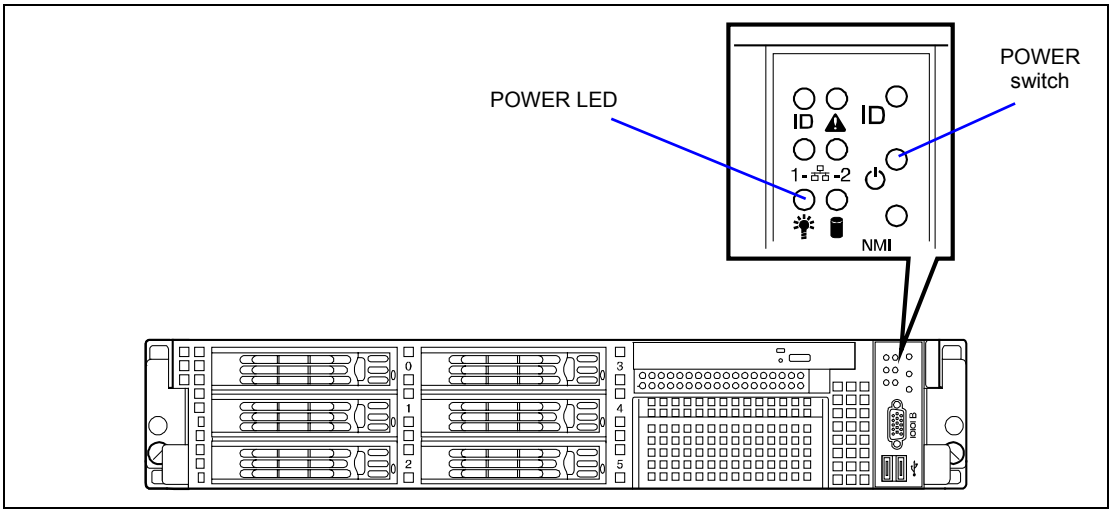
PREPARING FOR INSTALLATION AND REMOVAL

Follow the procedure below to prepare for installing or removing components.

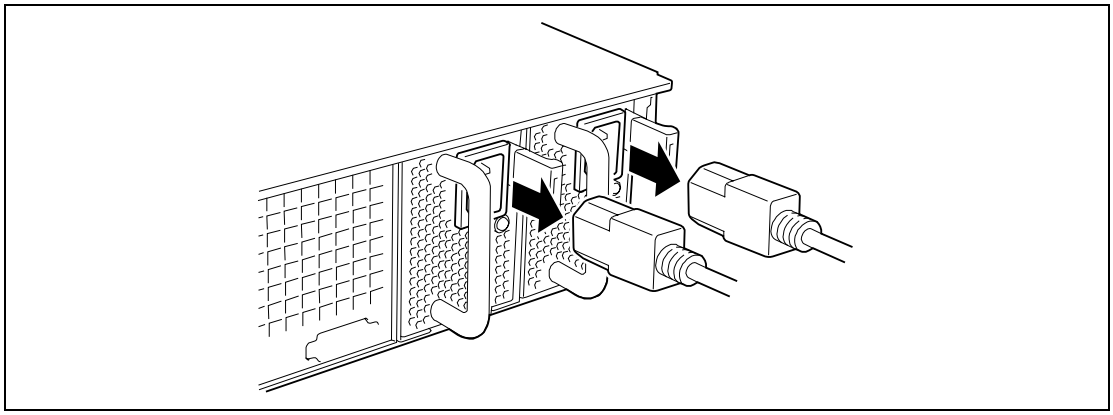
1. Shut down the OS.
2. Remove the front bezel from the chassis if installed.



3. Press the POWER switch to power off the server (the POWER LED goes off).



4. Remove all cables and power cords from the server.



Prepare a Phillips screwdriver and a flat-head screwdriver to install or remove the component.

The server needs to be pulled out from the rack for installing/removing any components other than the hard disk drives and power supply units.

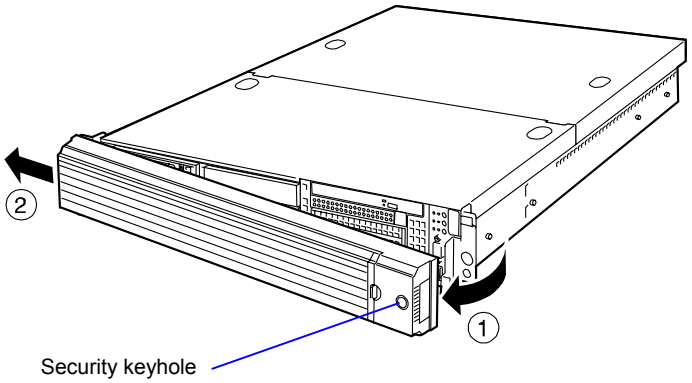
⚠ CAUTION

Observe the following instructions to use the server safely. Failure to follow these instructions may result in death or serious personal injury. See pages 1-3 to 1-8 for details.

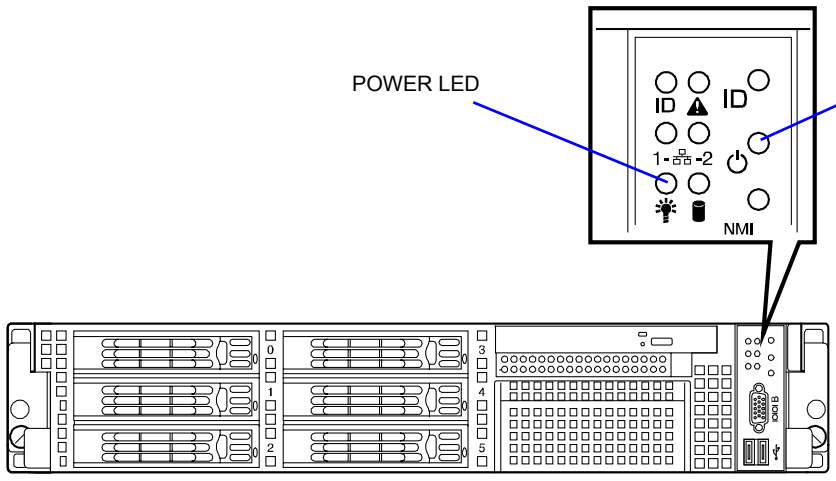
- Do not install the server on a rack with leaving covers removed.
- Do not pinch your finger with mechanical components.
- Note high temperature.
- Do not pull out a device from the rack if the rack is unstable.
- Do not leave more than one device being pulled out from the rack.

1. Shut down the OS.

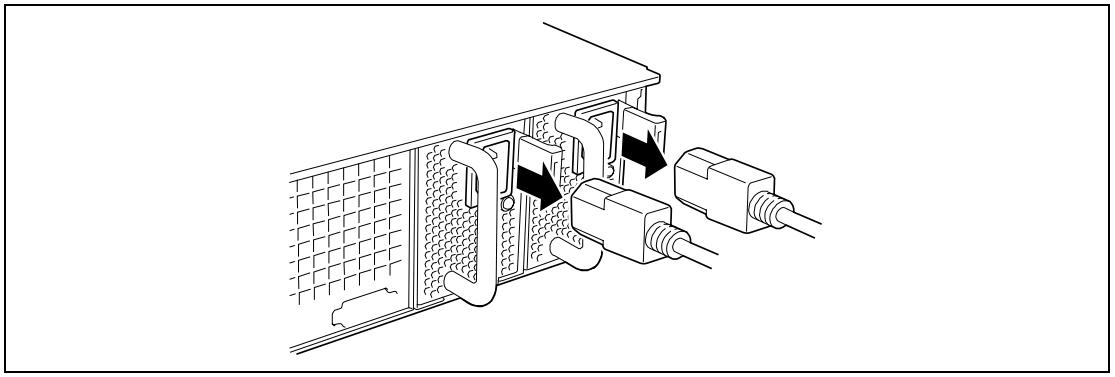
2. Remove the front bezel from the chassis if installed.



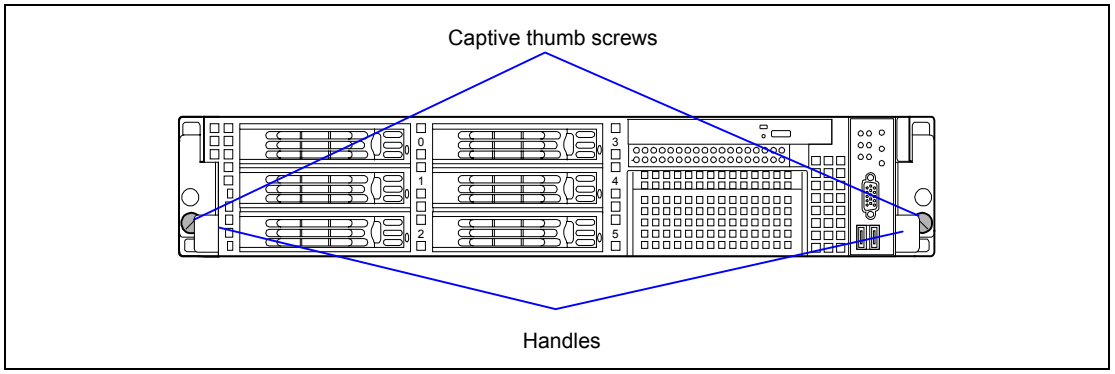
3. Press the POWER switch to power off the server (the POWER LED goes off).



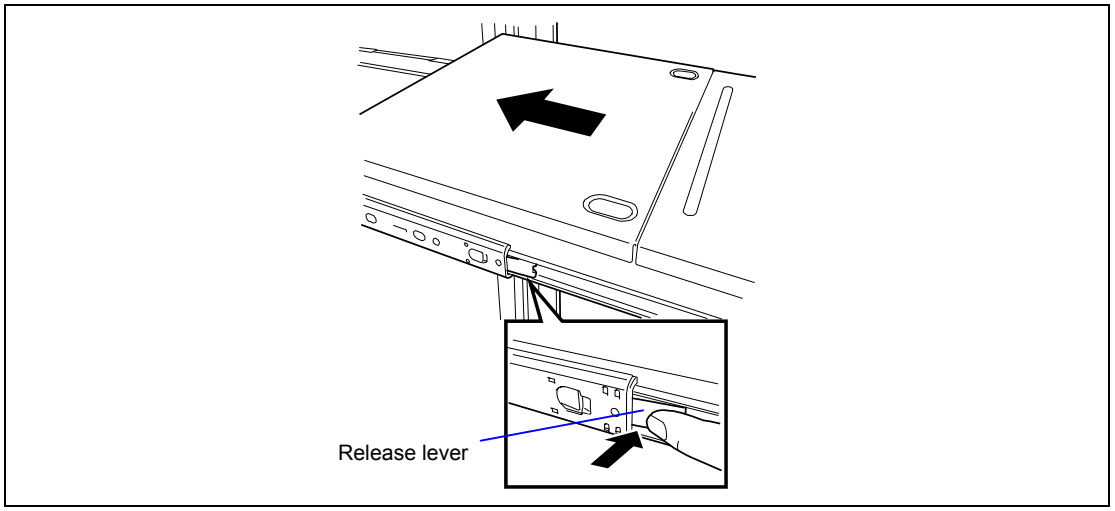
4. Remove all cables and power cords from the server.



5. Loosen the two captive thumbscrews on the front panel.
6. Hold the handles and slowly pull out the server from the rack until it locks.



When inserting the server back into the rack, push the release levers on the rails on the sides of the server to unlatch the server. Be very careful not to get your finger caught in doing so.



CONFIRMATION AFTER INSTALLATION/REMOVAL

Confirm the following after installing an additional option and removing a component:

- Installing removed components exactly as they were

  Install the components and cables, which were removed and disconnected for addition of an option, exactly as they were. Assembling without a component being installed or a cable being disconnected causes the server to malfunction.

- Confirming that no parts such as screws are left in the server

  Confirm that particularly conductive parts such as screws are not left in the server. Turning on the power with a conductive part on the mother board or cable terminal causes the server to malfunction.

- Confirming the cooling effect in the server

  Confirm that the ventilating holes are not covered with an internally connected cable. Insufficient cooling effect raises the internal temperature, which causes the server to malfunction.

- Confirming operation with a tool

  Some additional devices require the diagnostic utility or BIOS SETUP utility to check if they are installed correctly. For details, see the procedure for additionally installing the target device.

HARD DISK DRIVE

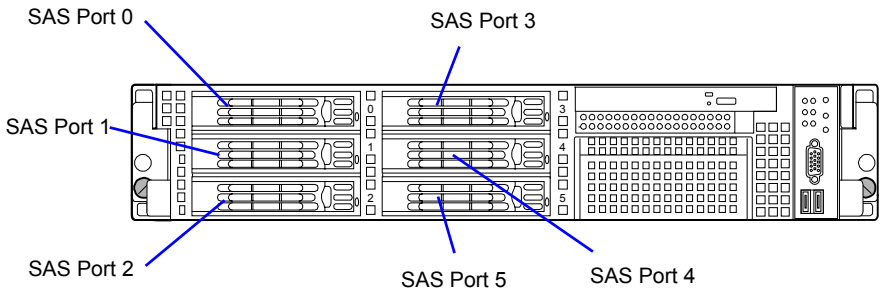
Your system supports the serial attached SCSI (SAS) hard disk drives.

IMPORTANT: Do not use any hard disk drives that are not authorized by NEC. Installing a third-party hard disk drive may cause a failure of the server as well as the hard disk drive. Purchase hard disk drives of the following models:

- N8150-199 (36.3 GB, 15,000 rpm, SAS)
- N8150-200 (73.2 GB, 15,000 rpm, SAS)
- N8150-201 (146 GB, 15,000 rpm, SAS)
- N8150-226 (300 GB, 15,000 rpm, SAS)

SAS Port

The hard disk drive bay may contain up to six hard disk drives. The SAS port numbers are factory-assigned to hard disk drives as shown below.



The hard disk drive bays are connected to the SAS connector on the mother board when the server is shipped.

A dummy block is installed in the hard disk drive bays except the one with SAS Port 0 defined. The purpose of a dummy block is to increase the cooling effect in the server. Install a dummy block in slots not containing a hard disk drive.

Installation

Take the following steps to install a hard disk drive. This procedure applies to all the hard disk drive bays.

NOTE: Any hard disk drive can be installed or removed in or from the server only by removing the front bezel.

IMPORTANT: In the disk array configuration, use the hard disk drives having the same specification including the capacity.

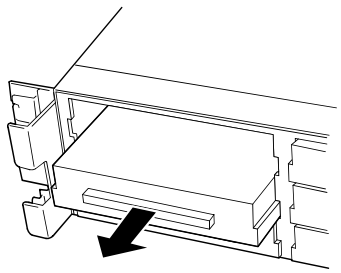
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock the front bezel with the security key and remove the front bezel.
3. Locate the slot in which you are going to install a hard disk drive.

   The server has six slots. Install hard disk drives in ascending order of the SAS port numbers. The or SAS port numbers assigned to the slots are all determined.

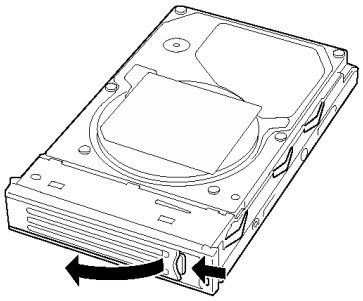
4. Remove the dummy block.

   A dummy block is installed in the hard disk drive bays except the one with SAS Port 0.

IMPORTANT: Keep the dummy block for future use.



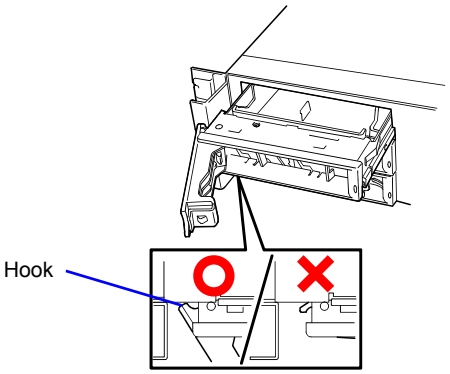
5. Unlock the lever of the hard disk drive carrier and open the handle.



6. Align the drive carrier with the bay guide rail.
7. Slide the drive carrier into the bay until it locks with the SCSI backplane connector.

IMPORTANT:

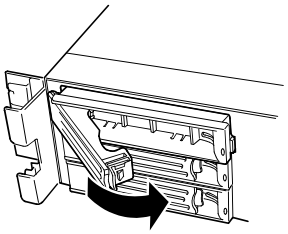
- Push the hard disk drive carrier until the hook of the handle hits the frame.
- Hold the hard disk drive carrier with both hands securely and carefully.



8. Close the lever ensuring the drive is secured.
   The handle is locked when a distinct "click" is heard.

IMPORTANT: Be careful not to get your finger caught between the handle and tray. Push the drive further to check if it is firmly secured.

NOTE: Confirm that the handle is hooked to the frame when having inserted the hard disk drive.



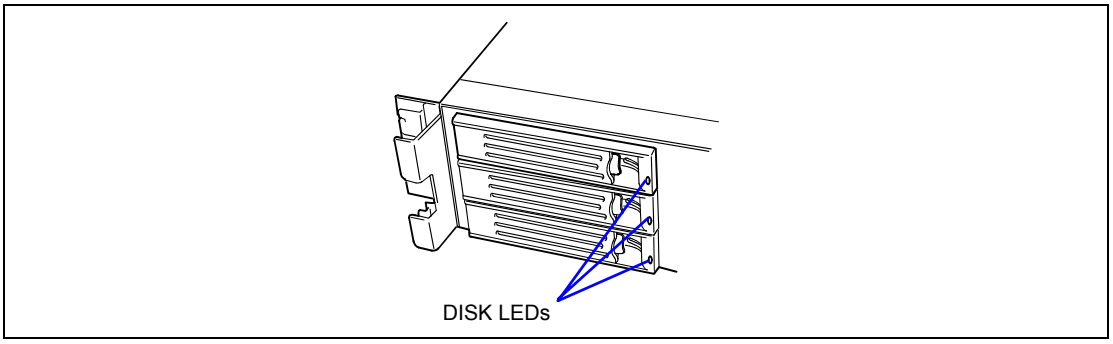
9. Install the front bezel you removed in step 2.

   There are tabs on the left side of the front bezel. Engage the tabs with the server frame, install the front bezel, and lock it with the security key.

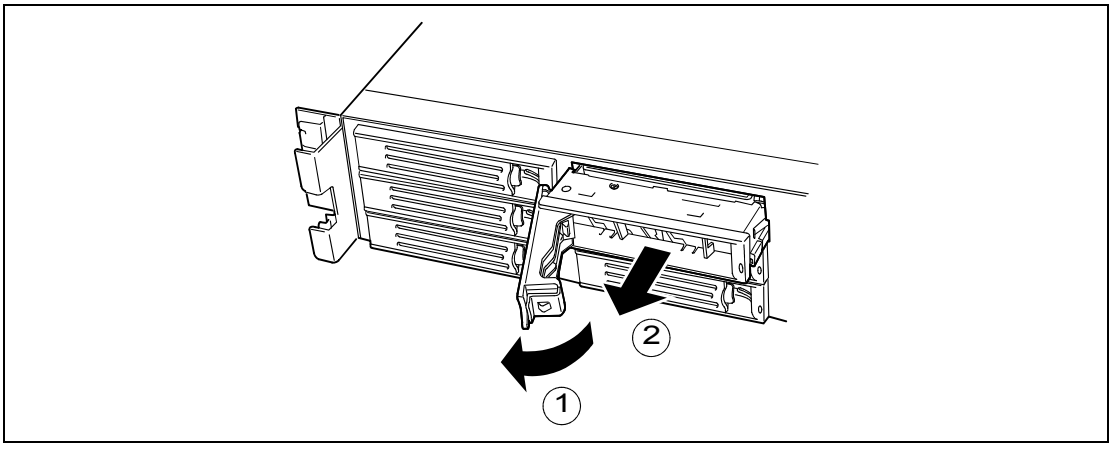
Removal

Take the following steps to remove a hard disk drive:

> **NOTE:** If removing a failing hard disk drive, confirm the slot in which the DISK LED of the hard disk drive is amber before starting the removal.



1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Unlock the front bezel with the security key, and remove the front bezel.
3. Push the lever to unlock, and put the handle down.
4. Firmly hold the handle and hard disk drive, and pull out the hard disk drive.
5. If using the server with the hard disk drive removed, install the dummy block in the empty slot.



6. Install the front bezel you removed in step 2.

When the hard disk drives are in the disk array configuration, you can restore the state before an error using the auto-rebuild feature that stores the data in the old hard disk drive into a new one.

The auto-rebuild feature is available for the RAID1, RAID5, or RAID10 disk array configuration.

NOTE: Onboard RAID controller supports RAID levels RAID0 and RAID1.

Auto-rebuild is carried out when you hot-swap a failed hard disk drive with a new one (replace the disk while the server is powered). While auto-rebuild is in progress, the DISK LED flashes green and amber alternatively to indicate it.

IMPORTANT:

- When auto-rebuild fails, the DISK LED lights in amber. Remove and install the hard disk drive again to restart auto-rebuild.
- If the disk array monitoring utility is installed, it may display or act as follows. If the DISK LED does not light in amber after auto-rebuild, however, auto-rebuild has completed successfully.
  - Displays "Rebuild was cancelled" on the screen while auto-rebuild is in progress.
  - Appears to stop and restart auto-rebuild.

Observe the following notes for auto-rebuild.

- Do not power off the server in the period between a hard disk drive error and completion of auto-rebuild.
- When you removed a hard disk drive, wait at least 90 seconds before installing the hard disk drive back again.
- Do not replace another hard disk drive while rebuilding is in progress. (The DISK LED flashes in green and amber alternatively while rebuilding the hard disk drive.)

POWER SUPPLY UNIT

Your server contains one or two power supplies.

The second power supply is optional and provides a redundant configuration that ensures continued operation of the system in the unlikely event one of the power supplies fails.

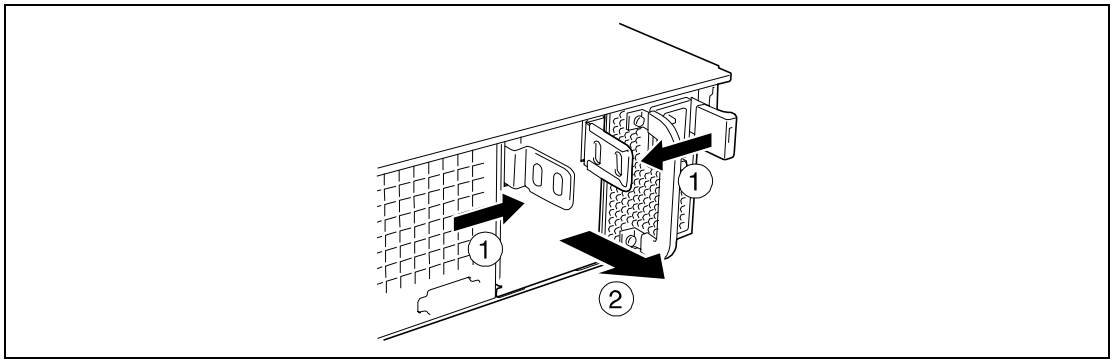
Installation

Take the following steps to install a power supply unit:

1. See the section "Preparing for Installation and Removal" described earlier to prepare.

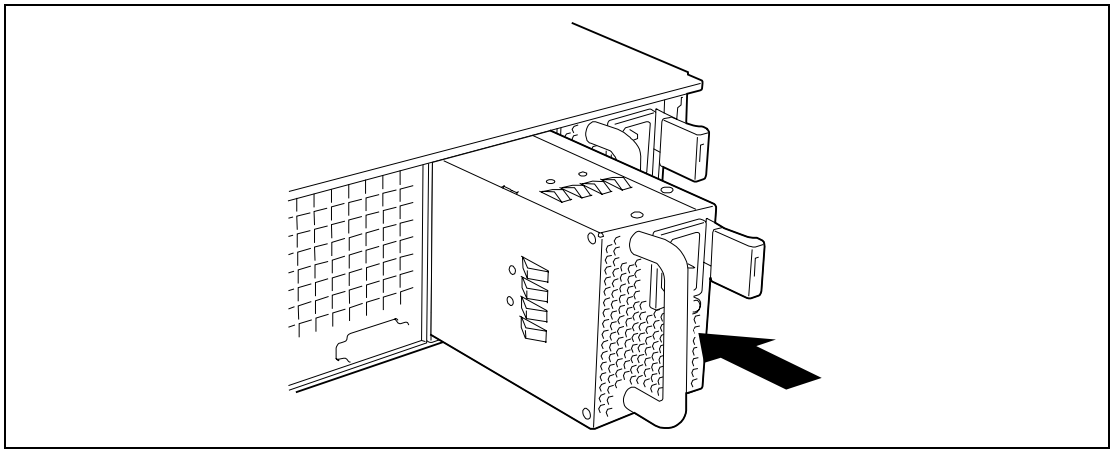
   IMPORTANT: Be sure to turn off the power. Failure to do so causes the server to malfunction or fail.

2. Pull the cable arm toward the rear of the server, and confirm the slot for installing an optional power supply unit.
3. Hold and pull the lever of the blank cover and remove the blank cover.

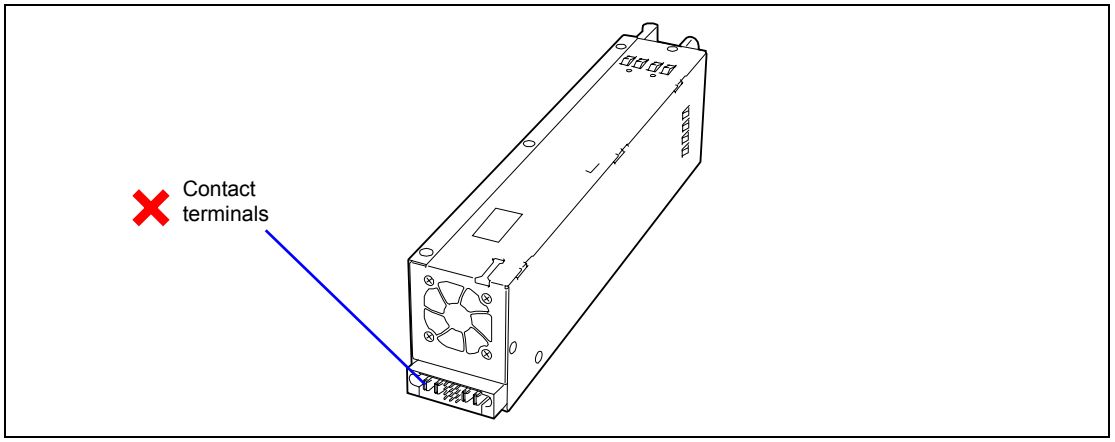


IMPORTANT: Keep the removed blank cover for future use.

4. Insert the power supply unit.

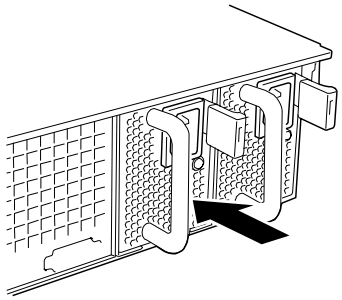


IMPORTANT: Do not touch the terminals of the power supply unit.



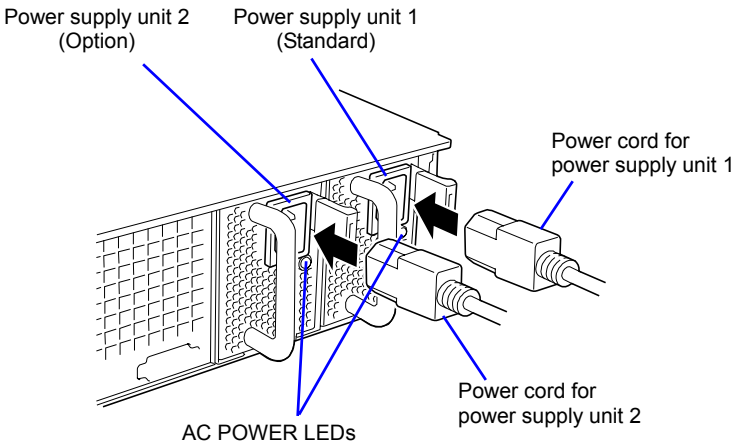
5. Grasp the handle and firmly push the power supply.

The power supply unit is locked when a distinct "click" is heard.



6. Connect two power cords.

Use the power cord provided with the standard power supply unit and the one provided with the system. The AC POWER LEDs flash when the power cords are connected.



7. Power on the server.

The AC POWER LEDs go on.

8. Confirm, by the STATUS LED or on the POST screen, that there are no errors related to the power supply units.

See Chapter 8 for details on the error messages.

If the AC POWER LEDs are off, reinstall the power supply units. If the same error message still appears, contact your service representative.

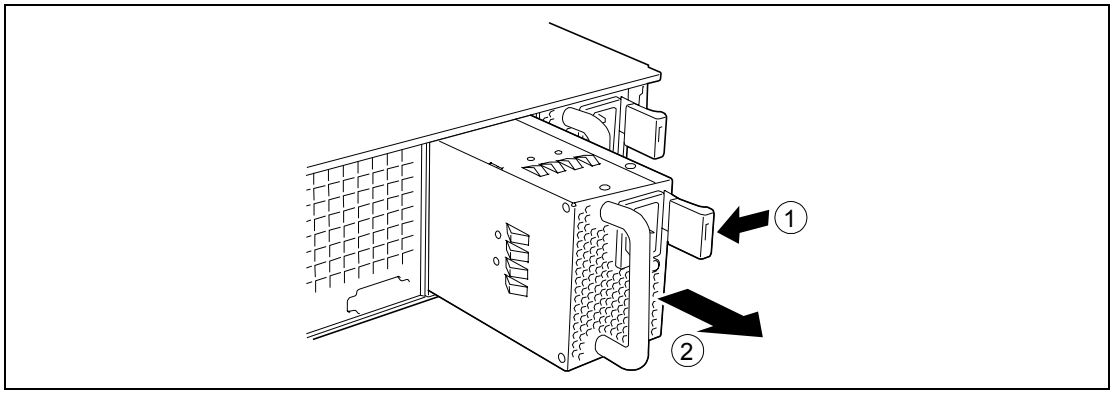
Replacing a Failing Power Supply Unit

Replace only a failing power supply unit.

> **IMPORTANT:** Do not remove a power supply unit operating normally.

> **NOTE:** If one power supply unit fails while the server contains two power supply units in a redundant configuration, the failing power supply unit can be replaced with the system operating (power-on state). (Skip step 2.)

1. Locate the failing power supply unit by the AC POWER LED on the rear of each power supply unit. (The LED of the failing power supply unit is amber.)
2. Shutdown the system, and press the POWER switch to turn off the power.
3. Disconnect the power cord from the failed power supply.
4. Hold the handle of the failing power supply.
5. While pressing the lever, pull the power supply to remove if from the chassis.



6. If operating the server with a single power supply unit without installing a new one, install the cover you removed in step 3 of installation procedure.

> **IMPORTANT:** To maintain the cooling effect in the server, install the blank cover in the vacant slot.

7. Install the new power supply unit taking steps 4 to 8 of "Installation", and confirm that the power supply unit is installed normally.

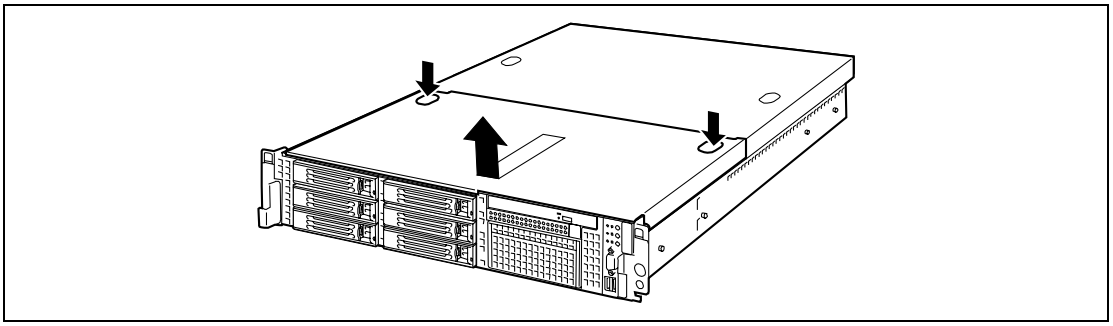
> **NOTE:** If one of the two power supply units of the server is replaced while the power is on, the POWER LED of the new power supply unit goes on. (If it is replaced while the power is off, the LED flashes. The LED goes on when the power is turned on.)

DRIVE COVER

Open the drive cover when installing/removing a processor and backup file device or reconnecting an internal cable.

Removal

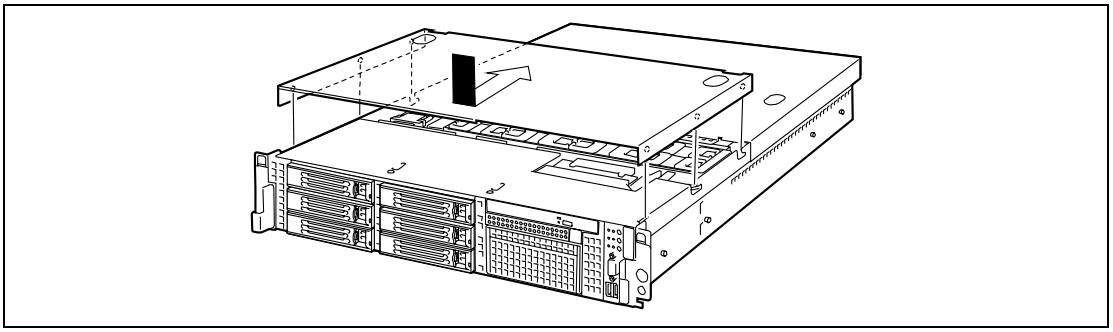
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Slide the drive cover toward the rear of the server while pressing the lock button on the cover.
4. Lift off the drive cover from the server.



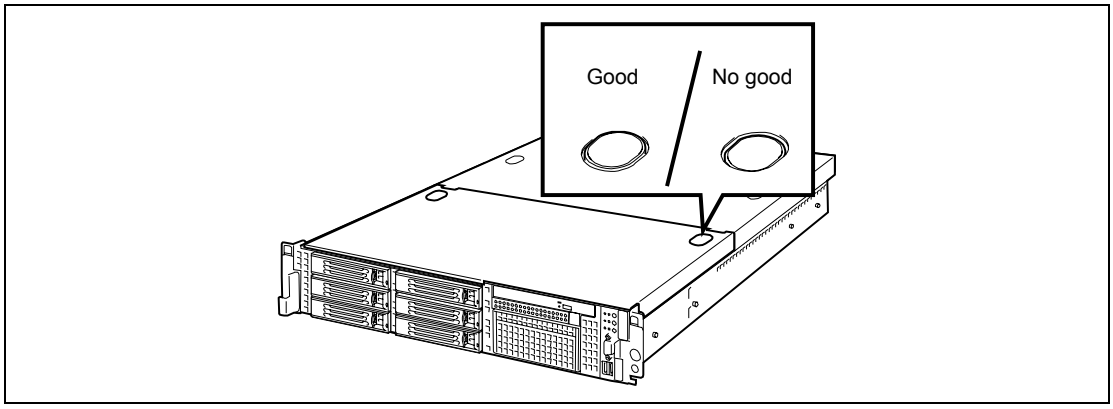
Installation

When installing the drive cover, confirm that the tab of the cover is securely inserted into the slot in the server frame.

Slide the drive cover toward the rear of the server. The drive cover is locked when a distinct "click" is heard. At this time, check the release button for normal state.



NOTE: The system must be operated with the drive cover installed to ensure proper cooling.

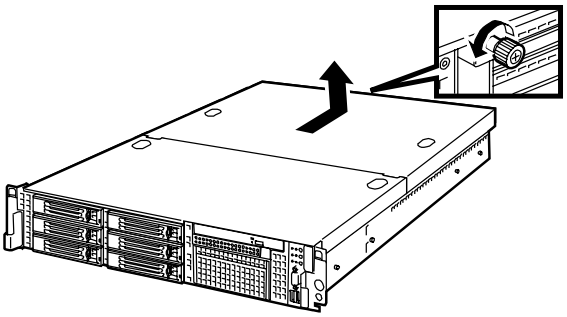


LOGIC COVER

Open the logic cover when installing/removing a DIMM, processor, and PCI add-in card or reconnecting an internal cable.

Removal

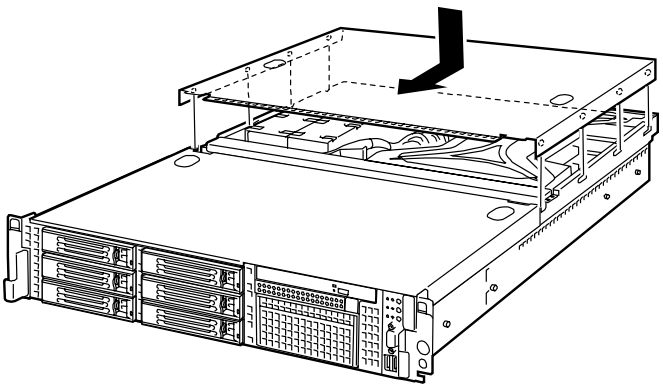
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Loosen a captive thumbscrew at the rear of the server.
4. Slide the logic cover toward the rear of the server and lift off the cover from the server.



Installation

When installing the logic cover, confirm that the tab of the cover is securely inserted into the slot in the server frame.

Slide the logic cover toward the rear of the server and secure the cover with captive thumbscrew.



DIMM

Install the additional DIMM (Dual Inline Memory Module) to the DIMM socket on the mother board in the server. The mother board is provided with 12 DIMM board slots.

NOTE: Up to 48GB of memory (4GB DIMM× 12) can be installed. (The factory-installed DIMMs need to be replaced in this case.) Two DIMMs of 1GB are factory-installed in DIMM slots #11 and #21.

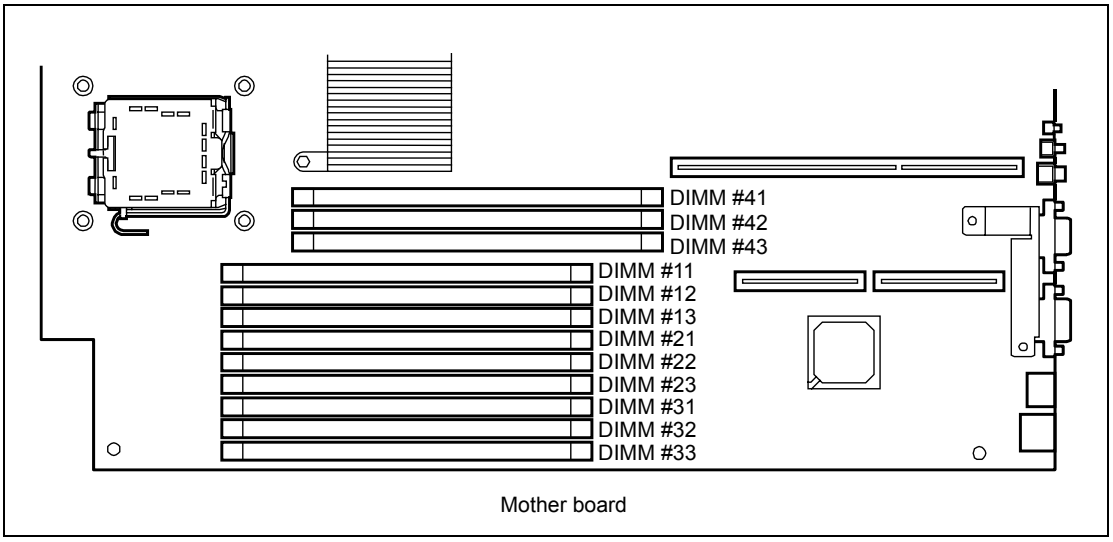
IMPORTANT:

- The DIMM is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the DIMM. Do not touch the DIMM terminals or on-board parts by a bare hand or place the DIMM directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Make sure to use the DIMM authorized by NEC. Installing a third-party DIMM may cause a failure of the DIMM as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.

Installation Order

DIMMs must be populated in pairs and in the following order:

Group #1, #2, #3, #4, #5, then #6.



Order	Group	Socket No.
1	1	#11 and #21
2	2	#31 and #41
3	3	#12 and #22
4	4	#32 and #42
5	5	#13 and #23
6	6	#33 and #43

IMPORTANT: Install a matched pair of DIMMS equal in speed and size.

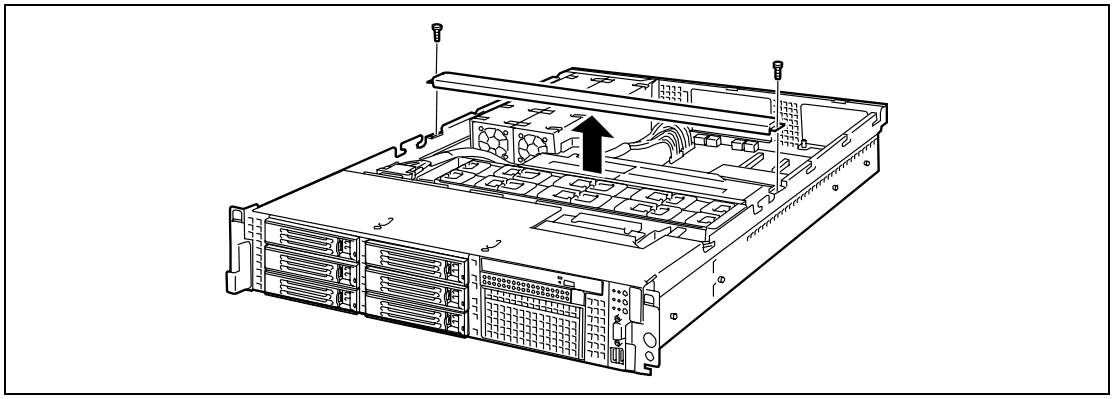
NOTE: Refer to "Using the Memory RAS Features" for configuring the memory mirroring and online spare memory features.

Installation

Install a DIMM in the following procedure.

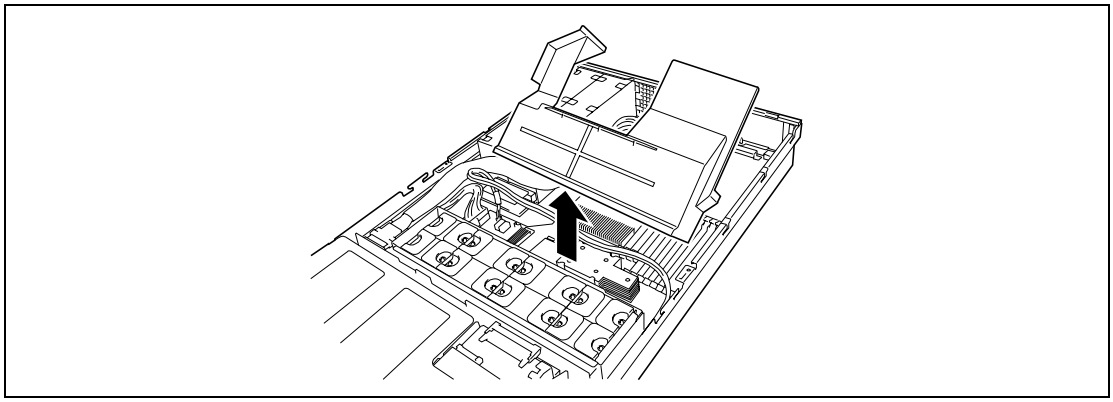
> **IMPORTANT:** The server supports DIMMs of only the low-profile type (30 mm (1.2 inches) in height). It does not support DIMMs exceeding the specified height.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Remove the logic cover and drive cover.
4. Remove the PCI riser module.
5. Remove two screws securing the support arm.
6. Remove the support arm from the chassis.



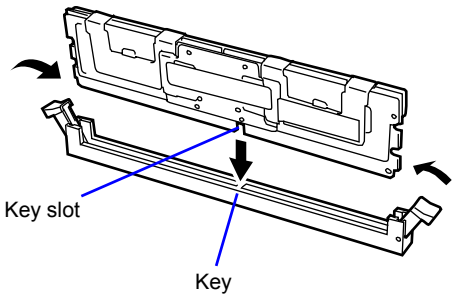
> **NOTE:** When the support arm comes up, you may lose the screws. Press firmly the support arm before removing the screws.

7. Remove the processor duct from the chassis.



8. Locate the DIMM socket which you are going to install DIMM.
9. Make sure the clips at either end of the DIMM socket(s) are pushed outward to the open position.
10. Holding the DIMM by the edges, remove it from its anti-static package.
11. Position the DIMM above the socket. Align the small notch at the bottom edge of the DIMM with the key in the socket.

NOTE: Make sure of the orientation of the DIMM.
Position the DIMM so that a notch in the bottom edge of the DIMM aligns with the keyed socket. Applying too much pressure can damage the socket. Keyed DIMMs insert only one way.

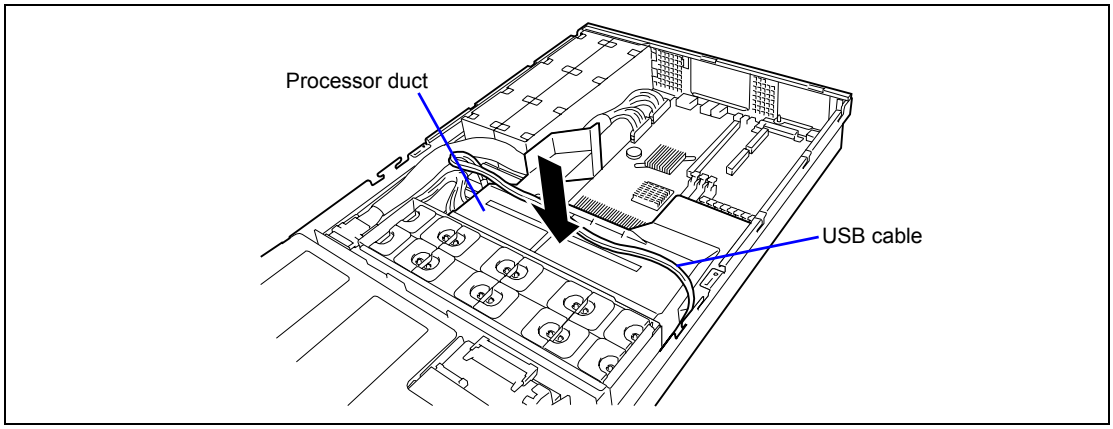


12. Insert the bottom edge of the DIMM into the socket.
13. When the DIMM is inserted, push down on the top edge of the DIMM until the retaining clips snap into place.

IMPORTANT:

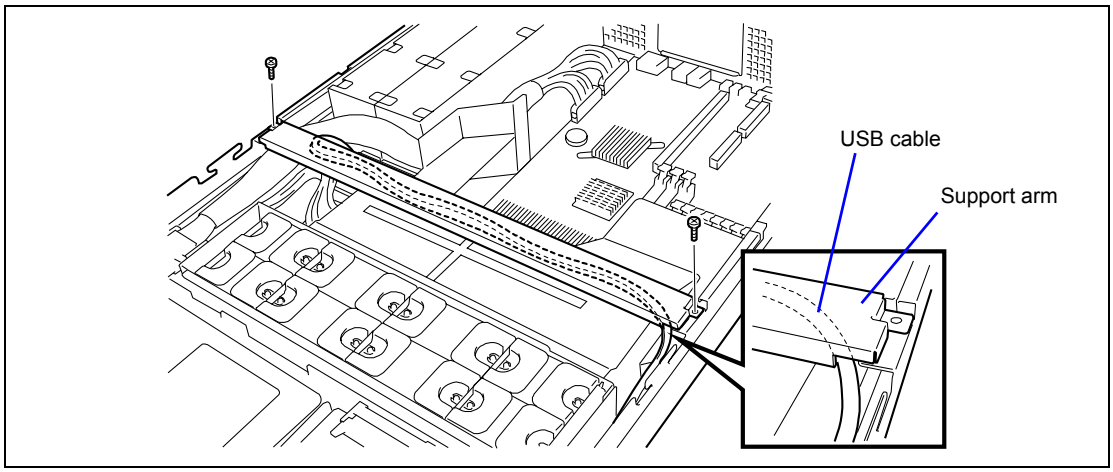
- To avoid damage to the socket, do not apply excessive force while pressing the DIMM.
- Make sure the clips are firmly in place.

14. Reinstall the processor duct.



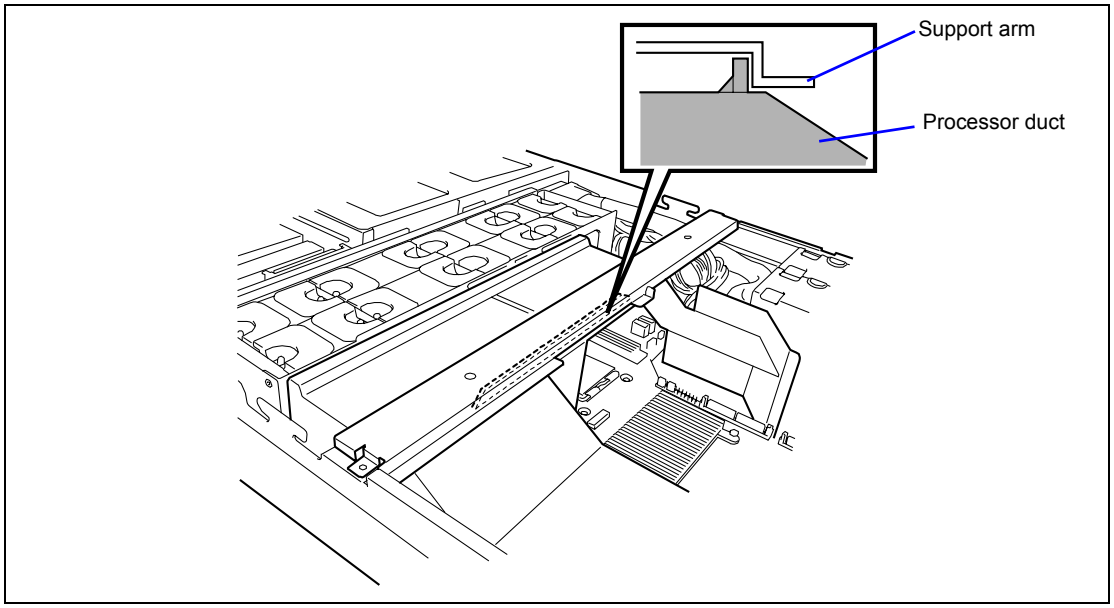
NOTE: Place the internal USB cable onto the processor duct (see figure above).

15. Reinstall the support arm.



NOTES:

- Make sure the support arm holds the processor duct firmly (see figure below).
- When the support arm comes up, you may lose the screws. Press firmly the support arm before tightening the screws.



16. Install the components you removed in steps 1 to 3.

17. Power on the server and verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.

18. Run the BIOS SETUP utility and select [Advanced] → [Memory Configuration] to verify that the installed DIMM shows the status "Normal". (See Chapter 4 or details.)

19. Select "Yes" for [Reset Configuration Data] on the [Advanced] menu.

This setting is required to change the hardware configuration data. See Chapter 4 for details.

20. If the Windows operating system is in use, set the paging file size to the recommended value (total memory size × 1.5) or a greater value. See Chapter 5 for details.

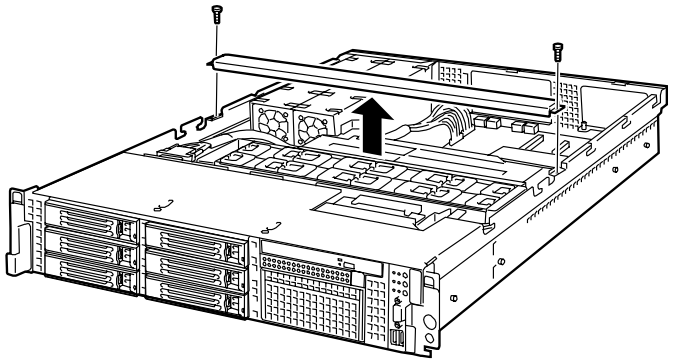
Removal

Remove the DIMM depending on the following procedure.

NOTES:

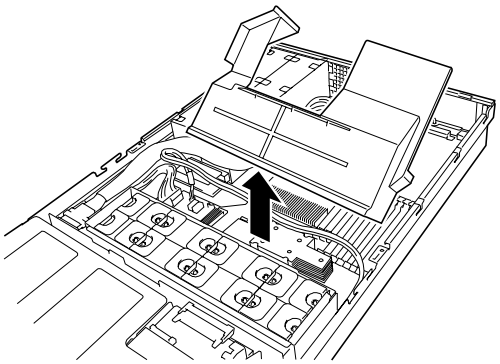
- To remove the failed DIMM, check the error message appearing in POST or NEC ESMPRO to identify the DIMM socket (group) in which the failed DIMM is installed.
- The server operates only when at least two DIMMs are installed.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Remove the logic cover and drive cover.
4. Remove the PCI riser module.
5. Remove two screws securing the support arm.
6. Remove the support arm from the chassis.



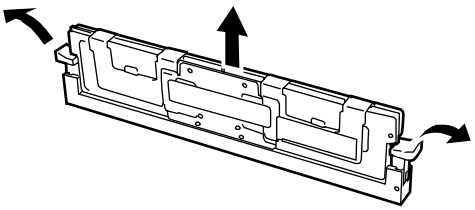
NOTE: When the support arm comes up, you may lose the screws. Press firmly the support arm before removing the screws.

7. Remove the processor duct from the chassis.



8. Open the clips at each end of the socket from which you remove the DIMM.

The DIMM pops out of the socket



9. Hold the DIMM by the edges, lift it away from the socket, and store it in an anti-static package.

10. Reinstall all parts removed in Steps 3 to 7.

See installation procedures for detail explanations.

11. Power on the server and verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.

12. Start the SETUP and select [Advanced] → [Memory Configuration] → [Memory Retest] → [Enabled] to clear the error information of the removed DIMM. (See Chapter 4 for details.)

13. Select "Yes" for [Reset Configuration Data] on the Advanced menu.

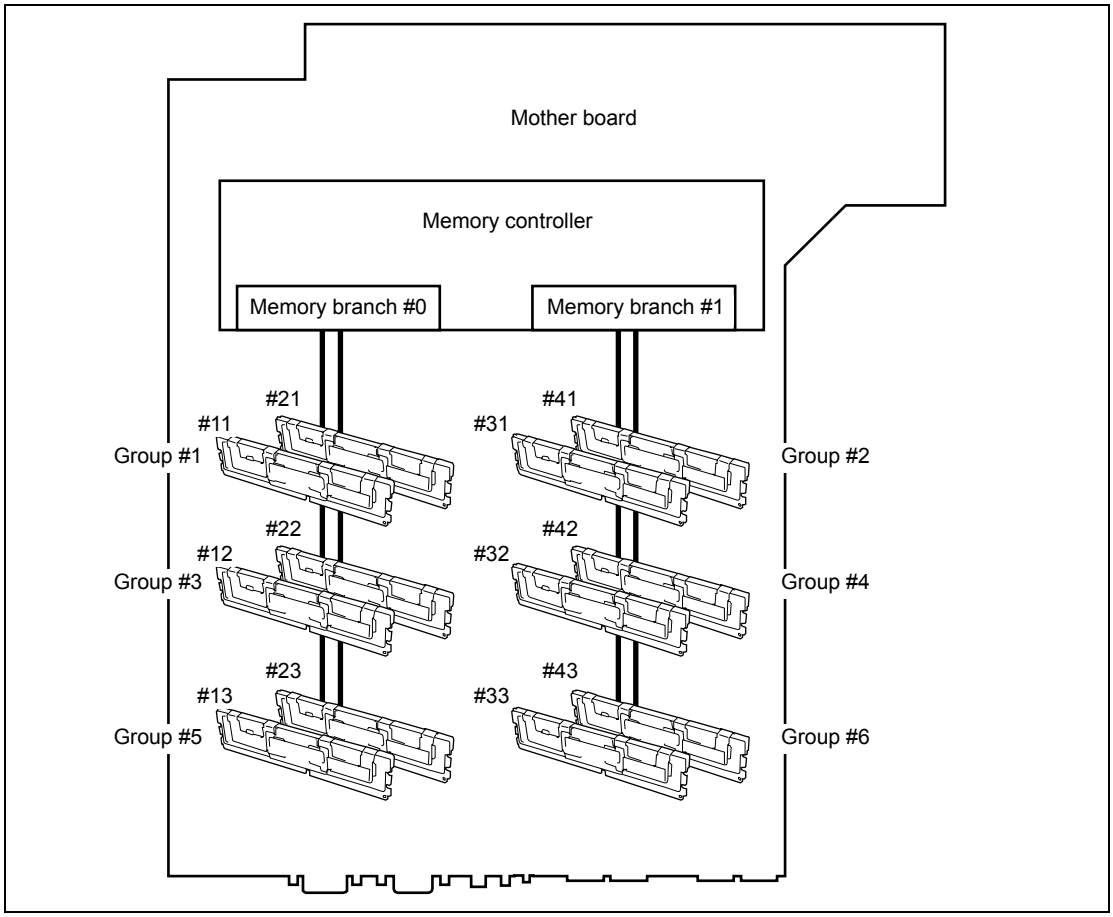
This setting is required to change the hardware configuration data. See Chapter 4 for details.

Using the Memory RAS Features

The server has the memory mirroring and online spare memory features as well as the chipkill ECC memory feature, which can automatically correct a memory error (multi-bit error) causing system shutdown.

> **IMPORTANT:** The memory mirroring and online spare memory features are not available in the normal memory configuration. (The chipkill ECC memory feature can operate in any configuration.)

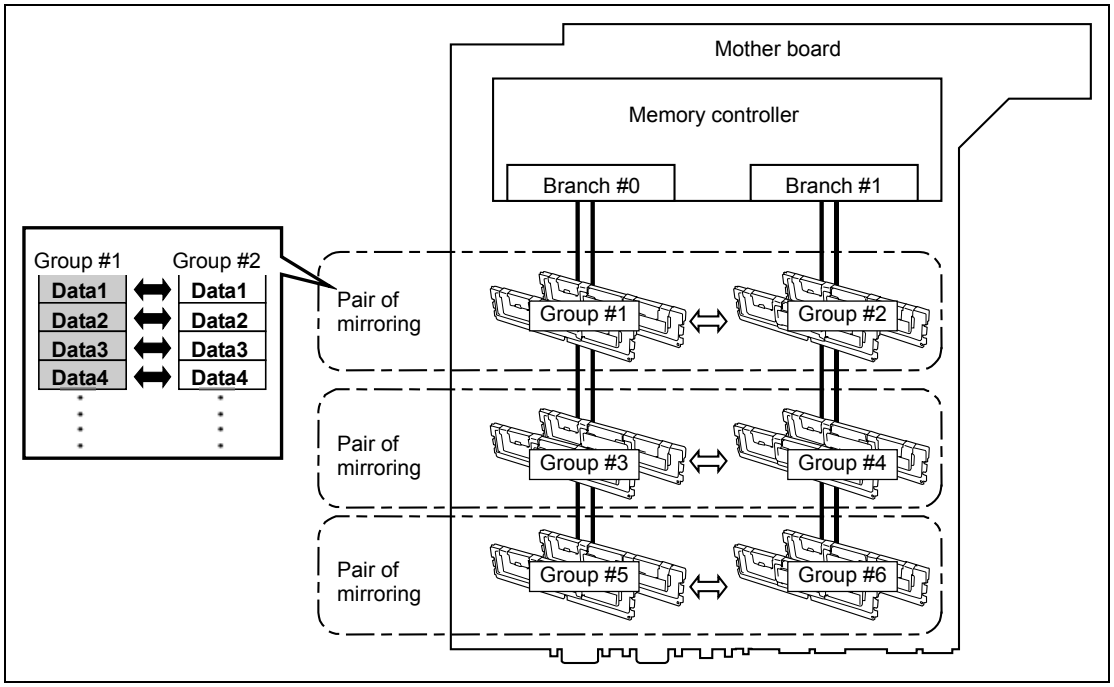
The memory area on the motherboard of the server is divided into two memory branches as shown in the figure below.



The memory mirroring and online spare memory features keep memory redundancy between memory branches and within a memory branch by monitoring or altering memory active/inactive status, respectively.

Memory Mirroring

The memory mirroring feature writes the same data into two groups of DIMMs corresponding with each other between memory branches (mirror set) to provide data redundancy.



NOTE: The operating system only recognizes a half of the total physical capacity.

The memory mirroring feature can be used under the following conditions:

- Install memory devices on four memory sockets configuring a mirror set.
- All the installed memory devices should have the same capacity.
- Run SETUP (see Chapter 4), change parameters appropriately in the [Mirror] menu selected as shown below, save the settings and exit from SETUP.

  [Advanced] → [Memory Configuration] → [Memory RAS Feature] → [Mirror]
- Install memory devices in the following order:

  Groups 1 and 2 → Groups 3 and 4 → Groups 5 and 6

The following mirroring cannot be configured:

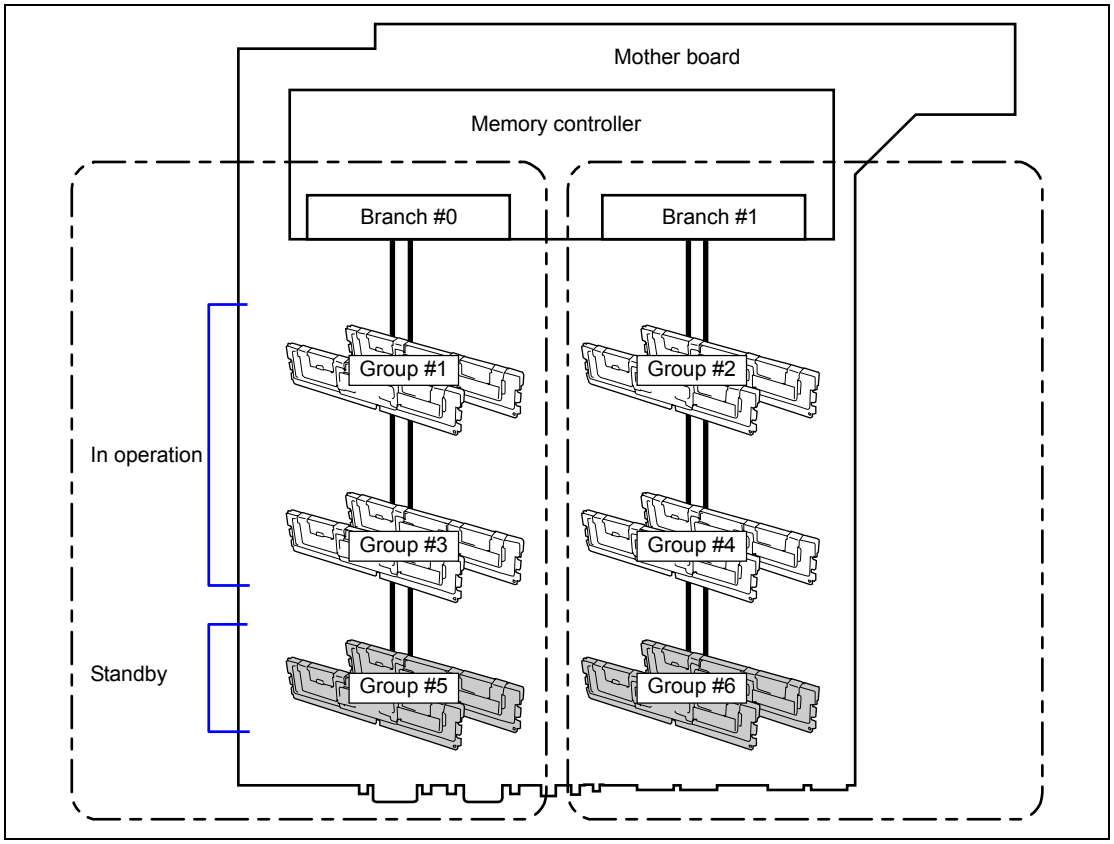
- Memory mirroring between different mirror sets
- Memory mirroring within a specific memory branch

The table below lists examples of DIMM installation patterns enabling the memory mirroring feature to be used.

Example	Memory Set (Group #)		Memory Set (Group #)		Memory Set (Group #)		Capacity	
	#1	#2	#3	#4	#5	#6	Physical	Logical
1	2GB	2GB	-	-	-	-	4GB	2GB
2	2GB	2GB	1GB	1GB	-	-	6GB	3GB
3	2GB	2GB	2GB	2GB	-	-	8GB	4GB
4	2GB	2GB	1GB	1GB	1GB	1GB	8GB	4GB
5	2GB	2GB	1GB	1GB	2GB	2GB	10GB	5GB
6	2GB	2GB	2GB	2GB	1GB	1GB	10GB	5GB
7	2GB	2GB	4GB	4GB	4GB	4GB	12GB	6GB
8	2GB	2GB	2GB	2GB	2GB	2GB	12GB	6GB
9	2GB	2GB	1GB	1GB	4GB	4GB	14GB	7GB
10	2GB	2GB	4GB	4GB	1GB	1GB	14GB	7GB
11	2GB	2GB	2GB	2GB	4GB	4GB	16GB	8GB
12	2GB	2GB	4GB	4GB	2GB	2GB	16GB	8GB
13	2GB	2GB	4GB	4GB	4GB	4GB	20GB	10GB
14	4GB	4GB	4GB	4GB	4GB	4GB	24GB	12GB
15	8GB	8GB	8GB	8GB	8GB	8GB	48GB	24GB

Online Spare Memory

The online memory spare feature puts a group of memory devices within a memory branch into standby status as spare devices. If an unrecoverable error occurs in a DIMM of the running group, the feature automatically changes the running DIMM from the failed one to a DIMM in the standby group to continue the processing.



NOTE: The operating system recognizes the memory devices as those with capacities less than the actual physical capacities. (The recognized capacities vary depending on the number of DIMMs and the physical capacity per DIMM.)

The online spare memory feature can be used under the following conditions:

- Install memory devices to more than one group in each memory branch. The server can operate if the memory branches may be different in the number of DIMMs. For example, no error occurs if memory branches 0 and 1 include four DIMMs (or two groups) and six DIMMs (or three groups), respectively.
- DIMMs installed in a specific memory branch should have the same capacity. The server can operate as long as DIMMs of the same capacity are installed in each memory branch. (For example, the server can operate if the total capacity of memory branch 0 is different from that of memory branch 1.)
- Run SETUP (see Chapter 4), change parameters appropriately in the [Sparing] menu selected as shown below, save the settings and exit from SETUP.

  [Advanced] → [Memory Configuration] → [Sparing]
- Install memory devices in the following order:

  Group 1 → Group 3 → Group 5 for memory branch 0

  Group 2 → Group 4 → Group 6 for memory branch 1

The following sparing can be neither configured nor set.

- Sparing to anther memory branch
- Specification of arbitrary memory devices as spare. The group of the largest number within a specific memory branch can be specified as spare.

The table below lists examples of DIMM installation patterns enabling the online spare memory feature to be used. While the following patterns are provided for memory branch 0, the same patterns can also be adapted to memory branch 1.

Example	Memory Blanch #0 (Group #)			Capacity	
	#1	#3	#5	Physical	Logical
1	1GB	1GB	-	4GB	1GB
2	1GB	1GB	1GB	3GB	2GB
3	2GB	2GB	-	4GB	3GB
4	2GB	2GB	2GB	6GB	5GB
5	4GB	4GB	-	8GB	6GB
6	4GB	4GB	4GB	12GB	10GB
7	8GB	8GB	-	16GB	12GB
8	8GB	8GB	8GB	24GB	20GB

Depending on specification of memory controller, the spare memory is set in unit of rank memory.

The logical memory capacity of single rank memory differs from that of dual rank memory when online spare memory is specified.

- Single rank memory configuration

  Logical memory capacity = (Physical memory capacity * Number of DIMMs) – (Physical memory capacity)

- Dual rank memory configuration

  Logical memory capacity = (Physical memory capacity * Number of DIMMs) – (Physical memory capacity / 2)

The server supports the following product number.

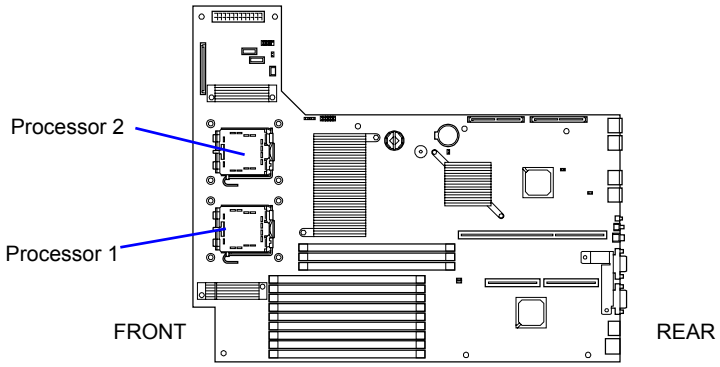
- N8102-254/277 (1GB memory): Single rank
- N8102-255/256/257/278/279/280 (2GB/4GB/8GB memory): Dual rank

PROCESSOR (CPU)

The server may have another CPU installed in addition to the standard CPU (Intel® Xeon® Processor).

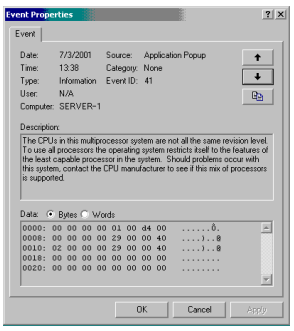
IMPORTANT:

- The CPU is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the CPU. Do not touch the CPU pins by a bare hand or place the CPU directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Do not operate the system until confirming that the additionally installed CPU is in normal state.
- Make sure to use the CPU authorized by NEC. Installing a third-party CPU may cause a failure of the CPU as well as the server. Repair of the server due to failures or damage resulted from installing such a board will be charged.



Mother board

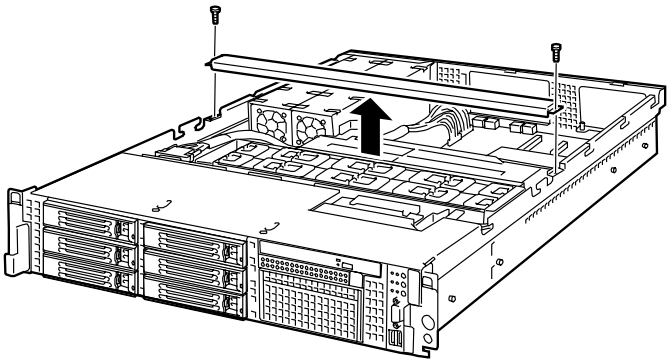
NOTE: If the different revision of the processor is installed in the multiprocessor system, Windows logs the following information every startup. If this message is logged, it is no problem for operation.


Event Properties
Event
Date: 7/3/2001 Source: Application Popup
Time: 13:38 Category: None
Type: Information Event ID: 41
User: N/A
Computer: SERVER-1
Description:
The CPUs in this multiprocessor system are not all the same revision level. To use all processors the operating system restricts itself to the features of the least capable processor in the system. Should problems occur with this system, contact the CPU manufacturer to see if this mix of processors is supported.
Data: Bytes Words
0000: 00 00 00 00 01 00 d4 00 .....Ô.
0008: 00 00 00 00 29 00 00 40 ....)..@
0010: 02 00 00 00 29 00 00 40 ....)..@
0018: 00 00 00 00 00 00 00 00 ....
0020: 00 00 00 00 00 00 00 00 ....
OK
Cancel
Apply

Installation

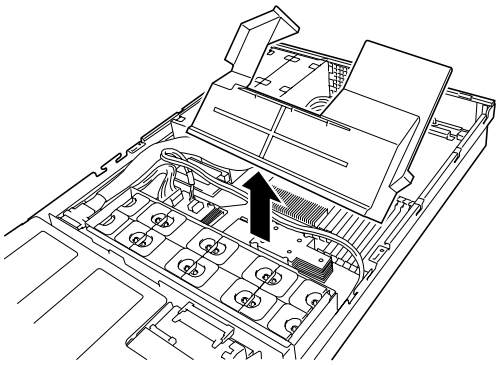
Take the following steps to install the CPU.

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Remove the logic cover and drive cover.
4. Remove the PCI riser module.
5. Remove two screws securing the support arm.
6. Remove the support arm from the chassis.



NOTE: When the support arm comes up, you may lose the screws. Press firmly the support arm before removing the screws.

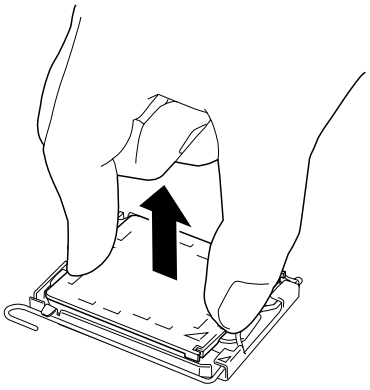
7. Remove the processor duct from the chassis.



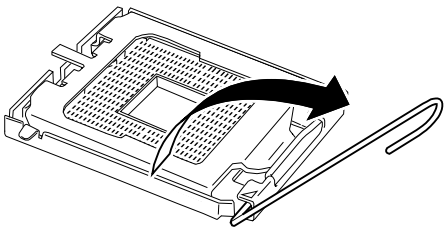
8. Locate the CPU socket which you are going to install CPU.

9. Remove the protective socket cover from the load plate.

IMPORTANT: Do not discard the protective socket cover. Always replace the socket cover if the processor is removed from the socket.

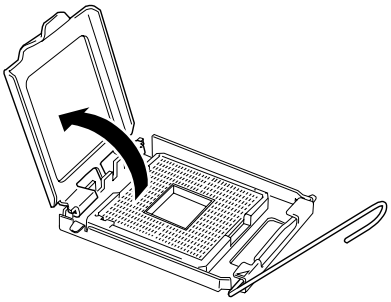


10. Open the socket lever by pushing the lever down and away from the socket.



11. Lift the load plate.

IMPORTANT: Do not touch the socket contacts.



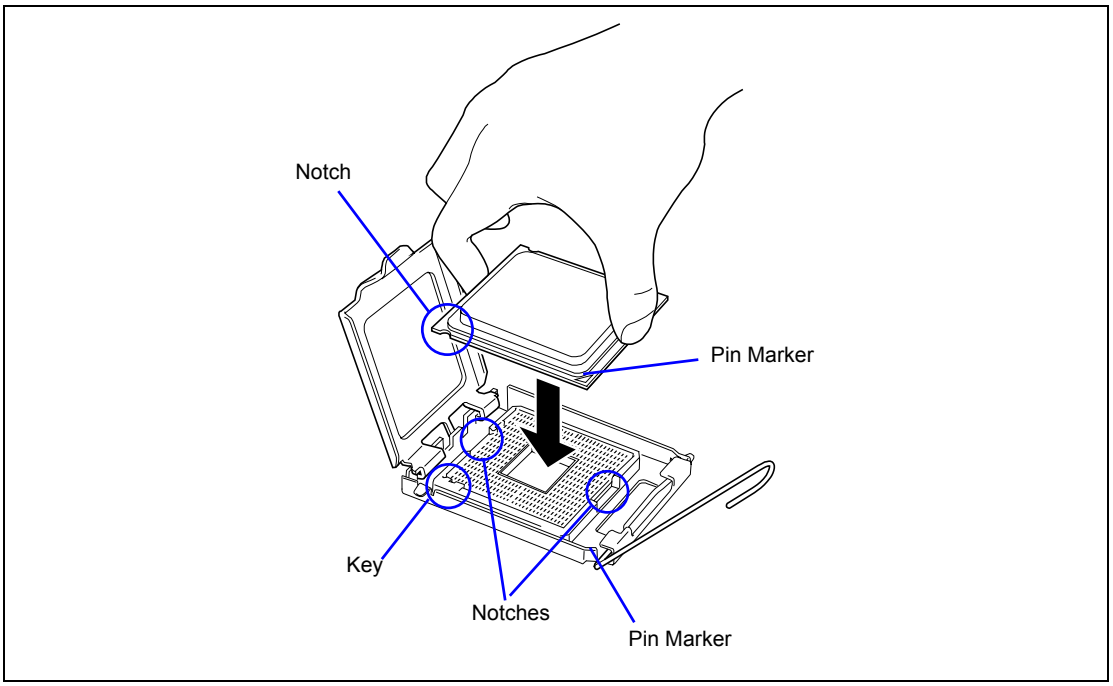
12. Remove the processor from the protective cover.

IMPORTANT:

- Hold the processor only at the edges, being careful not to touch the bottom of the processor.
- Do not discard the protective processor cover.
- Always replace the processor cover if the processor is removed from the socket.

13. Hold the processor with your thumb and index fingers oriented as shown in the figure below.

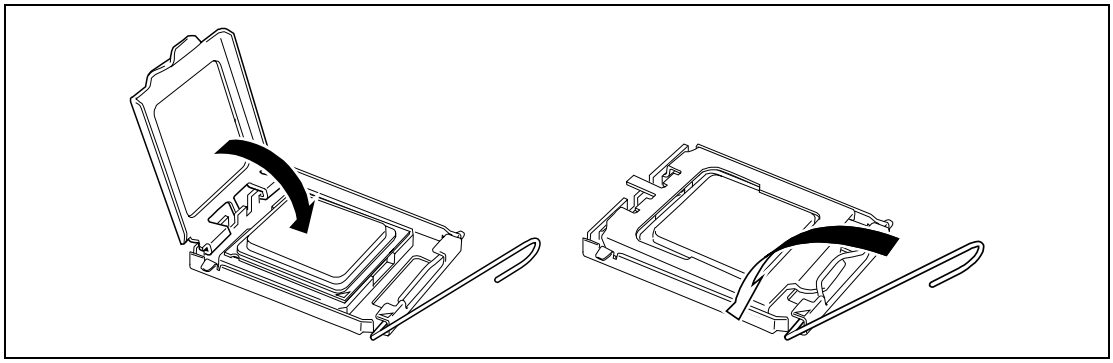
IMPORTANT: Make sure fingers align to the socket cutouts.



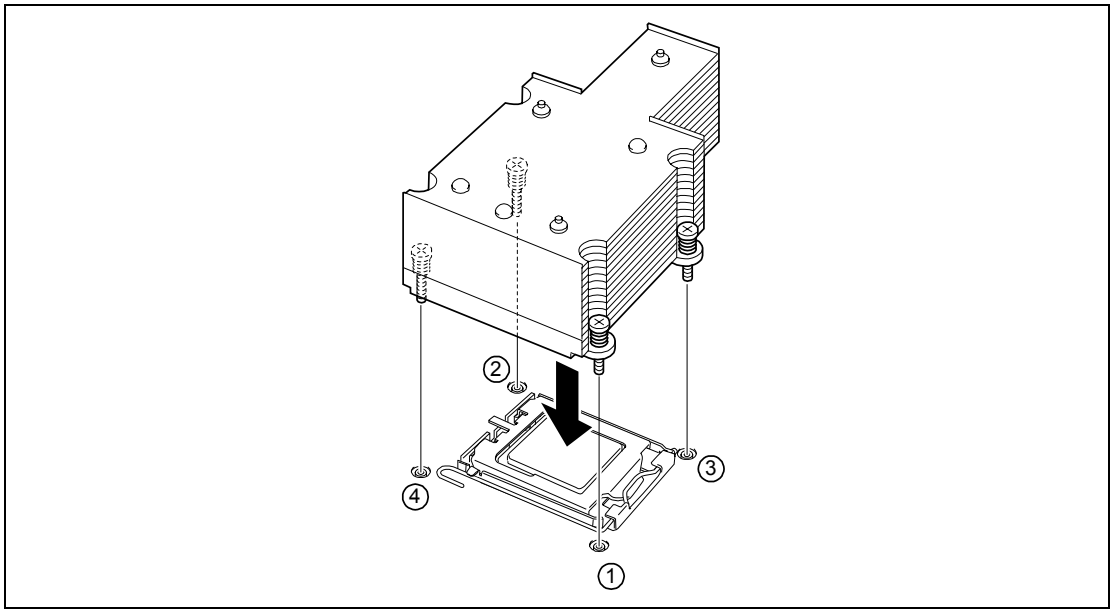
14. Align notches with the socket.

15. Lower the processor straight down without tilting or sliding it in the socket.

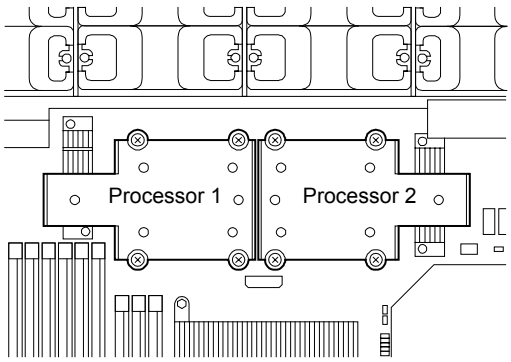
16. While pressing down on the load plate, close and engage the socket lever.



17. Put the heat sink on CPU and fix the heat sink with four screws.



NOTE: Be aware of direction of heat sink (see figure below).

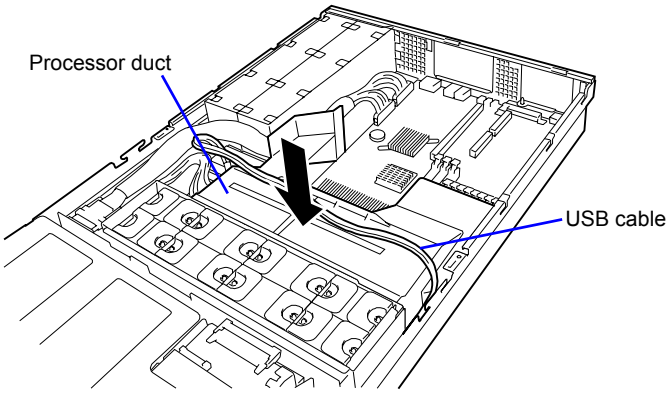


18. Make sure that the heat sink is level.

NOTES:

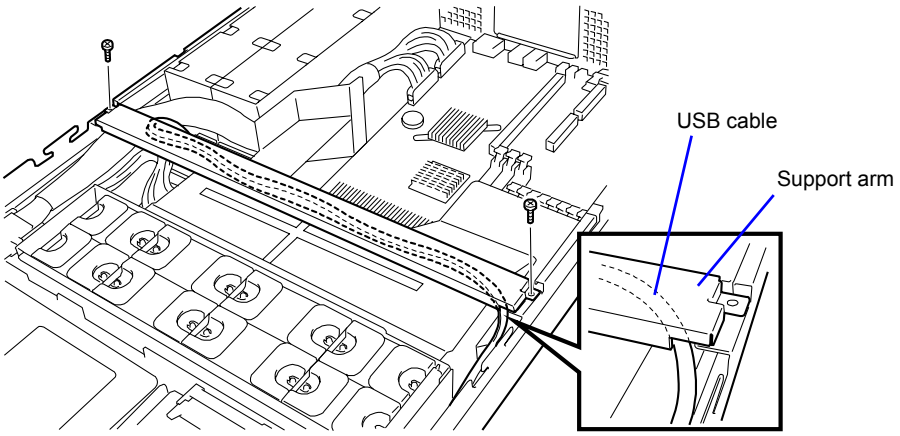
- If the heat sink is not level, remove it, and then install it again. The following probably causes the heat sink not to be level:
  - The CPU is not positioned correctly.
  - All screws are not completely tightened.
- Do not move the secured heat sink.

19. Reinstall the processor duct.



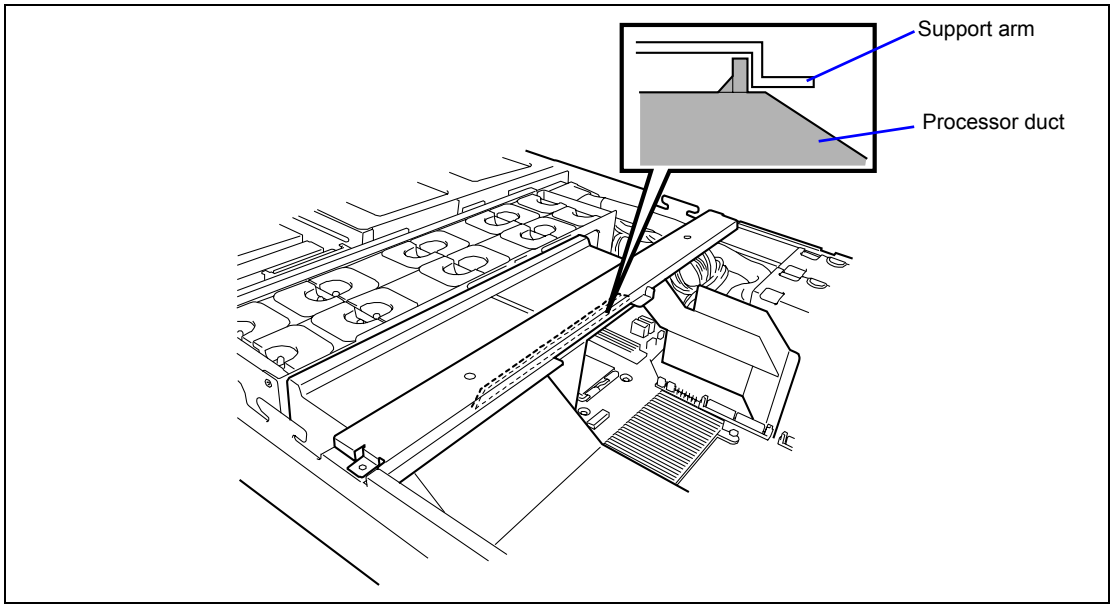
NOTE: Place the internal USB cable onto the processor duct (see figure above).

20. Reinstall the support arm.



NOTES:

- Make sure the support arm holds the processor duct firmly (see figure below).
- When the support arm comes up, you may lose the screws. Press firmly the support arm before tightening the screws.



21. Install the covers you removed previously.

22. Power on the server, start the SETUP utility, and set "Processor Retest" of "Processor Settings" on the Main menu to "Enable".

23. Verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.

24. Set "Reset Configuration Data" on the Advanced menu to "Yes".

This setting is required to change the hardware configuration data. See Chapter 4 for details.

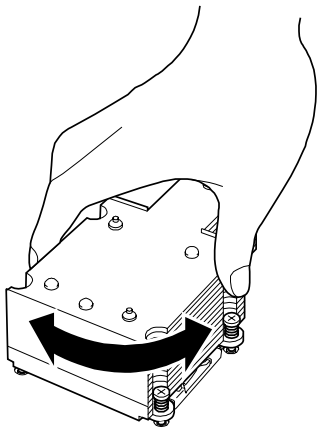
25. To add one or more CPUs to the server in 1-CPU configuration to operate the server with more than one CPU, change the driver of [Computer] in the device manager to [ACPI multi-processor PC] and then update the system (see Chapter 5).

Removal

To remove the CPU, prepare the removal referring to steps 1 and 7 in the installation procedure and do the reverse procedure of steps 17 to 9.

IMPORTANT:

- Do not remove any CPU unless it is failed.
- After the operation, heat may make the cool seat at the bottom of the heat sink adhere to the CPU. To remove the heat sink from the CPU, first turn the heat sink to the left and right lightly to make sure that the heat sink can be apart from the CPU. Removing the heat sink with it adhering to the CPU may cause the CPU and/or socket to be defected.



Do the following procedure if a CPU is removed (or replaced).

1. Start SETUP to select menus "Main" – "Processor Settings" – "Processor Retest" in the order to clear the error information on the removed CPU (see Chapter 4).

   When a CPU is replaced, select menus "Main" – "Processor Settings" to confirm that the ID and L2 Cache of the additional CPU are defined normally (see Chapter 4).

2. Set "Reset Configuration Data" on the Advanced menu to "Yes."

   This is required to update the hardware configuration information. See Chapter 4 for details.

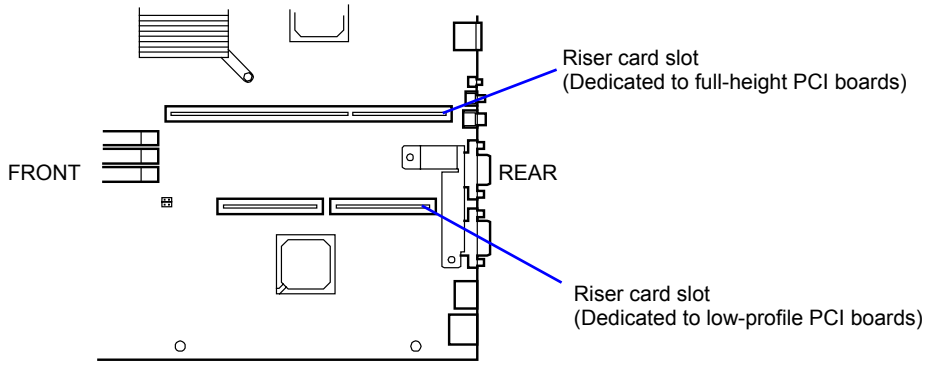
PCI BOARD

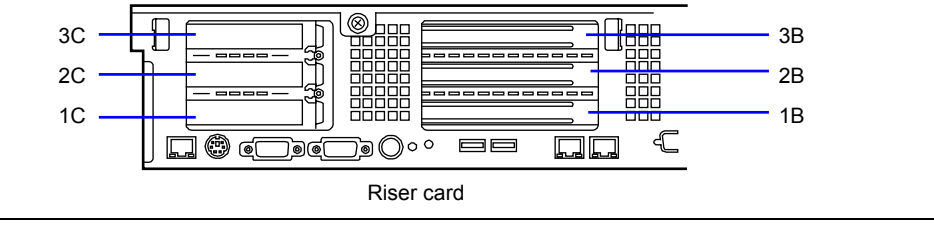
The server has two "riser cards" on the mother board that enable installation of PCI boards. Three PCI boards can be installed on each riser card. (Up to six PCI boards can be installed in total.)

Insert PCI boards for network extension and file device function extension into PCI board slots in each riser card.

IMPORTANT:

- The PCI board is extremely sensitive to static electricity. Make sure to touch the metal frame of the server to discharge static electricity from your body before handling the PCI board. Do not touch the PCI board terminals or on-board parts by a bare hand or place the PCI board directly on the desk. For static notes, see the section "Anti-static Measures".
- Some restrictions are imposed on the combination of PCI boards which can be installed in the server. Contact your service representative for details.
- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.





Notes

Observe the following notes on installing/removing a PCI board:

- Do not touch the terminals of the riser cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- A riser card is designed for installing only low-profile PCI boards or full-height PCI boards. Before installing a PCI board, make sure of the card specification.
- The mother board is not equipped with a connector for LED relay cable.
- The system searches for the PCI board in the following order:

  PCI Slot 3B → 1B → 2B → 1C → 3C → 2C

  When N8116-02 is installed:

  PCI Slot 3B → 2B → 1B → 1C → 3C → 2C

- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or disk array BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

	Bus number	Device number	Function number
Onboard NIC1	C	0	0
Onboard NIC2	C	0	1
Onboard SAS	D	5	0
Slot 1C	18	0	X
Slot 2C	20	0	X
Slot 3C	1C	0	X
Slot 1B	0D *	3	X
Slot 2B	0D *	9	X
Slot 3B	3 *	0	X

  * On certain PCI devices, other bus number may be assigned..

- Set "Disabled" for the optional ROM of a LAN device not to be booted by using the BIOS SETUP utility.
- If an additional LAN device is installed in slot 3C or 3B, it is hard to push the catch of the connector with your finger that is connected to the LAN port. Disconnect the connector pushing the catch with a standard screwdriver. At this time, be very careful for the screwdriver not to damage the LAN port or other ports.

- If a bootable PCI board (e.g., a disk array controller, SCSI controller, or LAN card) is additionally installed, the boot priority is changed to the default. After the additional installation, start the BIOS SETUP utility, select the [Boot] menu, and set the new boot priority.
- If an option operating with only 33 MHz is installed in one of the slots (1C, 2C, and 3C, or 1B, 2B, and 3B) on a PCI riser card, the options installed in the other slots of the same riser card are subjected to operation with only 33 MHz.
- Contact your service representative for the acceptable optional PCI board.

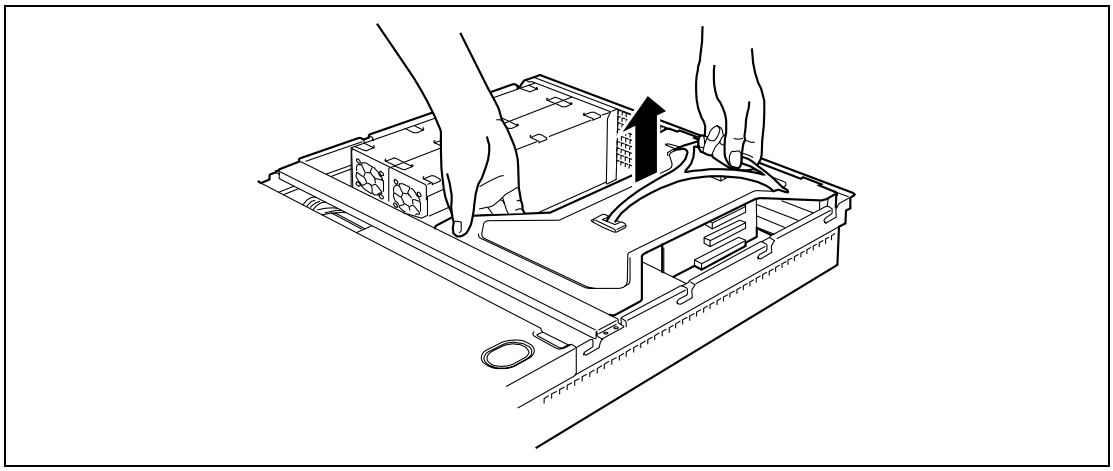
Installation

Take the following steps to install a PCI board on the riser card:

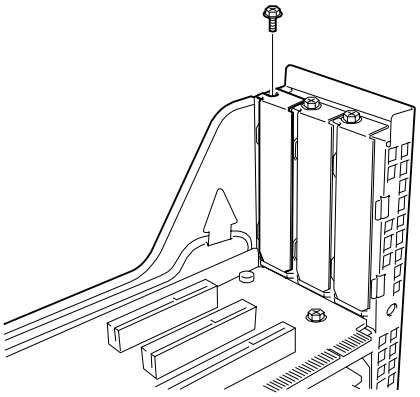
IMPORTANT:

- Each riser card supports low-profile or full-height PCI boards. Before installing a PCI board, confirm that the type of the PCI board.
- When installing a PCI board, confirm that the card connector matches the connector of the riser card.

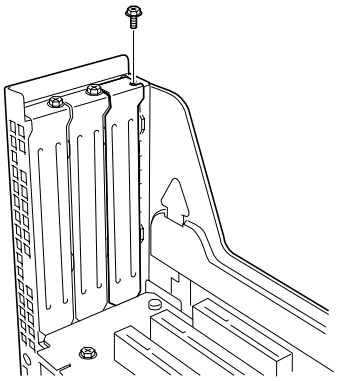
1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Remove the logic cover.
4. Lift straight up and remove the riser module assembly from the server.



5. Remove a screw securing an expansion slot cover.



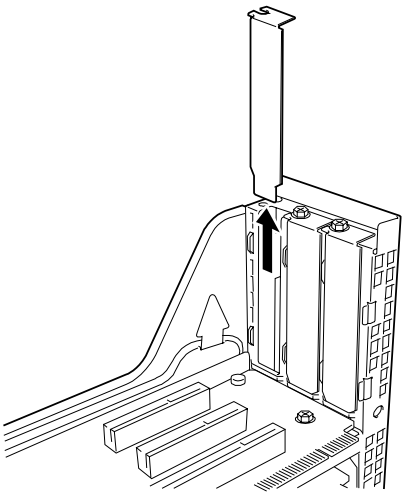
Low-profile type



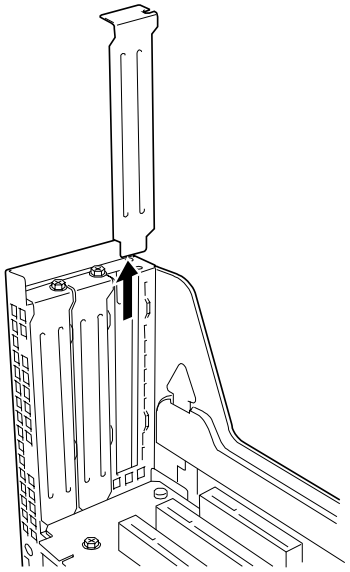
Full-height type

6. Remove the extension slot cover.

NOTE: Keep the removed extension slot cover for future use.



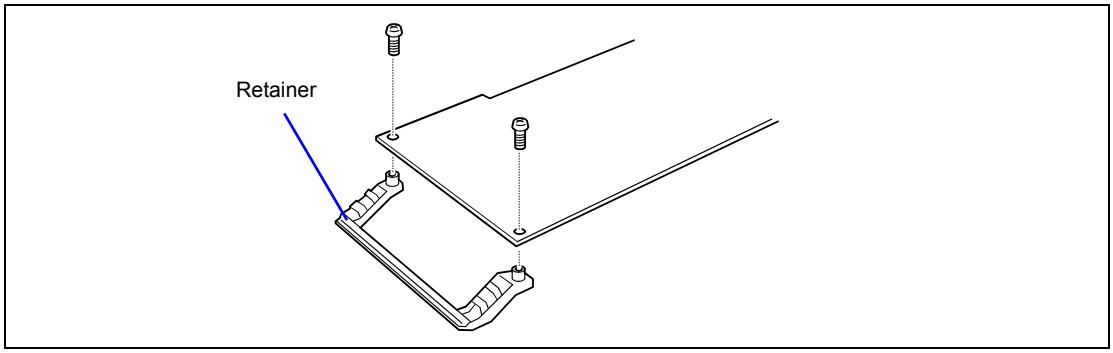
Low-profile type



Full-height type

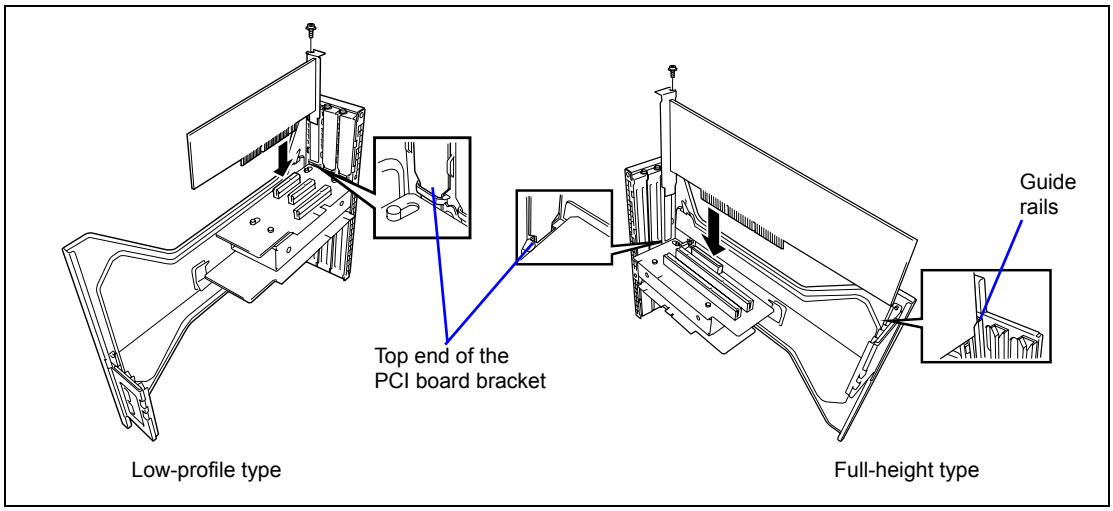
7. <This step is required only for a PCI board of the full-height/full-length type.>

Before installing a PCI board of the full-height/full-length type, remove the retainer from the PCI board, and then unlock and open the card retainer clip on the other side of the guide rail.



8. Install the PCI board on the riser card.

Align the PCI board terminal section with the riser card slot, and firmly push the PCI board until it is fully seated.



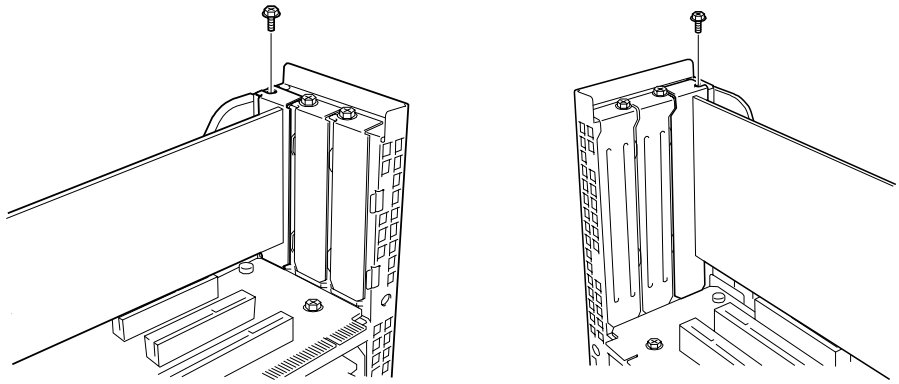
IMPORTANT:

- Do not touch the terminals of the riser cards and PCI boards with your bare hand. Fingerprints and dust left on them cause the server to malfunction.
- If you are unable to install a PCI board correctly, remove it, and then install it again. Be careful not to apply excess force to a PCI board or riser card. Doing so may damage the card.

NOTES:

- Confirm that the top end of the PCI board bracket is inserted in the designated slot of the riser card.
- If a full-height PCI board is installed, confirm that the PCI board bracket and the edge of the opposite card are inserted in the guide rails of the riser card.

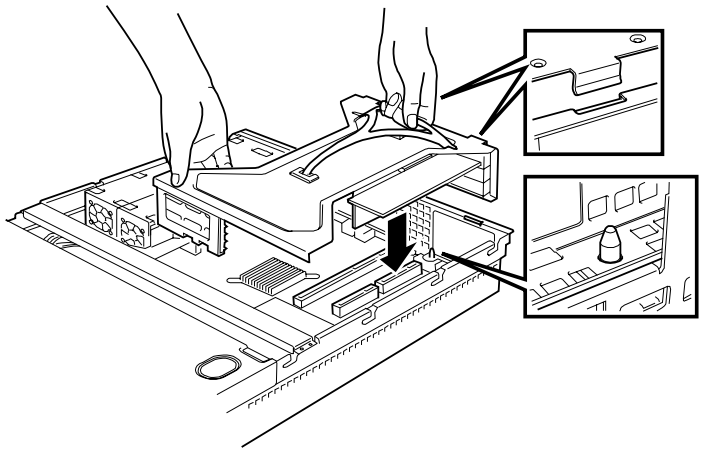
9. Secure the board with a screw removed in Step 5.



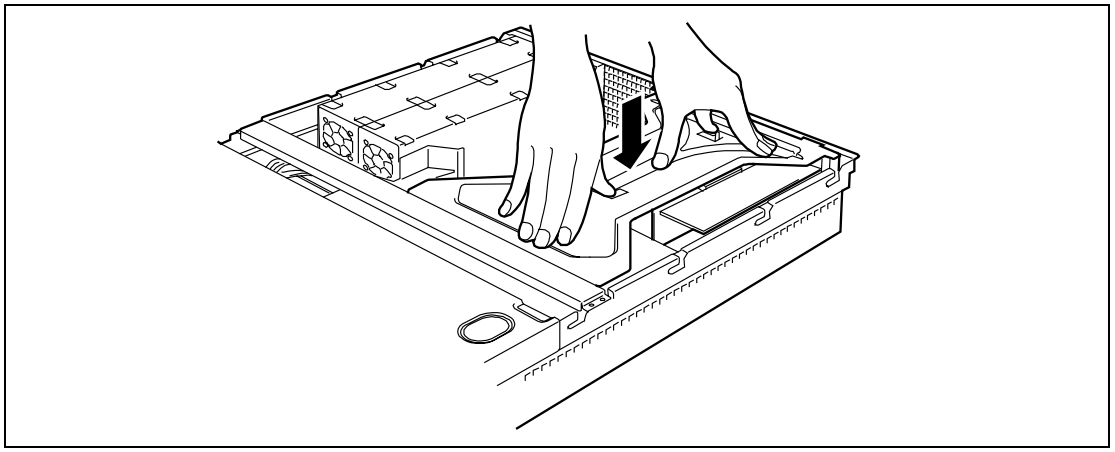
Low-profile type Full-height type

10. Insert the riser card into the slot on the mother board.

Align the riser card terminal section with the slot on the mother board, and firmly push the riser card until it is fully seated.



11. After the insertion, press the riser card down with your fingers until it is fully seated.



12. Install the components you removed previously.

13. Verify that POST displays no error messages.

If POST displays an error message, take a note on the message and see the POST error messages listed in Chapter 8.

14. Select "Yes" for [Advanced] → [Reset Configuration Data].

This setting is required to change the hardware configuration data. See Chapter 4 for details.

15. Start the BIOS configuration utility in the installed card, and set up the card.

Presence/absence of the utility and the start and operation methods depend on the card. For details, see the manual provided with the card.

Removal

Remove a PCI board in reverse order of the installation steps.

DISK ARRAY CONTROLLER BOARD

The disk array controller board is an optional PCI board provided to improve data reliability.

Installing the disk array controller board allows you to use hard disk drives in the device bays of the server and those in the optional expansion disk cabinet in the disk array configuration.

IMPORTANT:

- The disk array controller board is extremely sensitive to static electricity. Make sure to touch the metal frame of the Server to discharge static electricity from your body before handling the disk array controller board. Do not touch the disk array controller board terminals or on-board parts by a bare hand or place the disk array controller board directly on the desk. For static notes, see the section "Anti-static Measures" described earlier.
- Making hard disk drives in the disk array configuration or changing the RAID level initializes hard disk drives. If the hard disk drive to be configured in the array has your valuable data stored, make sure to make a backup copy of the data before installing the disk array controller board and configuring the array.
- The disk array configuration requires at least two hard disk drives.
- Use hard disk drives of the same capacity and performance (e.g., revolution) for each pack to configure them in the array.

NOTES:

- Before installing a disk array controller board, start the SETUP utility, select [Advanced] → [PCI Configuration], and confirm that [Enabled] is set for the parameter [PCI Slot xx ROM] (xx: PCI slot number).
- Your mother board includes the RAID controller. The onboard RAID controller supports the RAID0 and RAID1.
- A disk array configuration of RAID1 or RAID5 increases disk reliability. However, the actually available capacity becomes smaller than the total hard disk drive capacity in the disk array configuration.

Installation

See "PCI Board" in this chapter and manual that comes with the optional RAID controller for the installation of a disk array controller.

Removal

Remove a disk array controller board in reverse order of the installation steps.

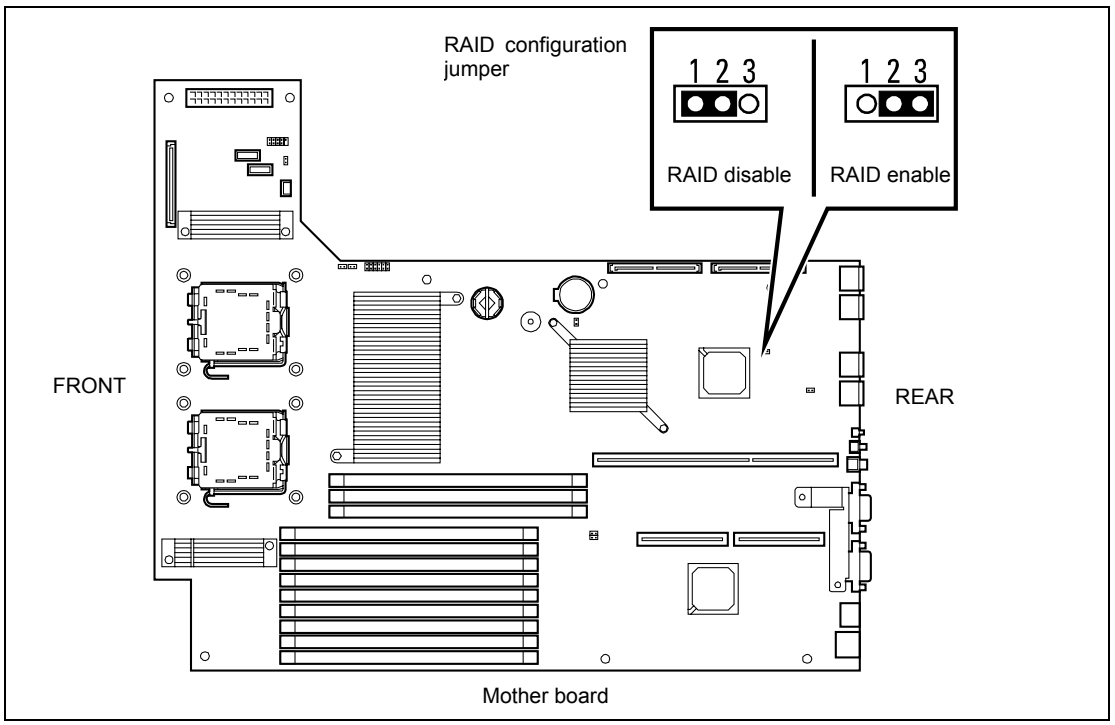
Use of internal hard disk drives in a disk array configuration

This subsection describes how to configure the internal hard disk drives installed in your system to the RAID drives.

Onboard RAID Controller (RoMB)

RAID controller is factory embedded in your mother board.

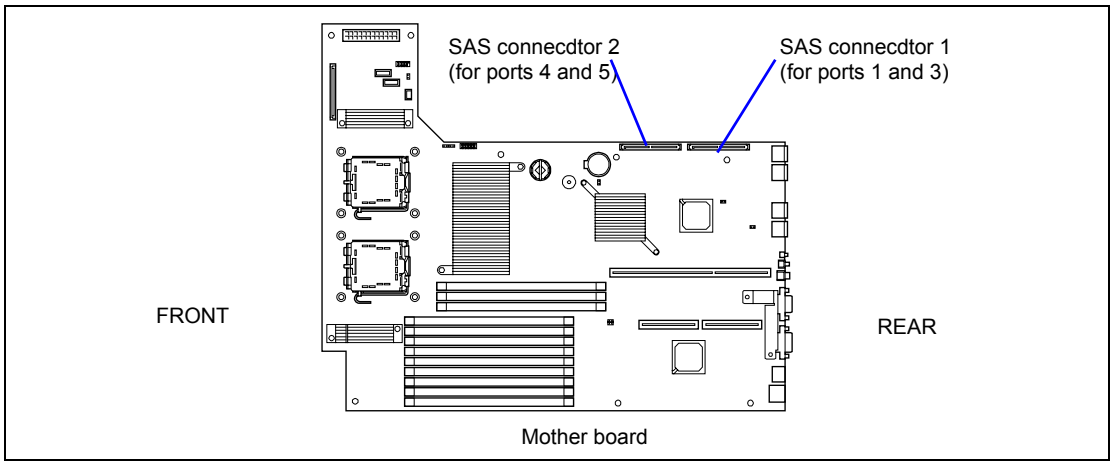
To enable the onboard RAID controller, use the RAID configuration jumper on the mother board as shown below. After changing the jumper setting, run the RAID configuration utility to configure the RAID system. Refer to Chapter 4 for detail.



Optional RAID Controller

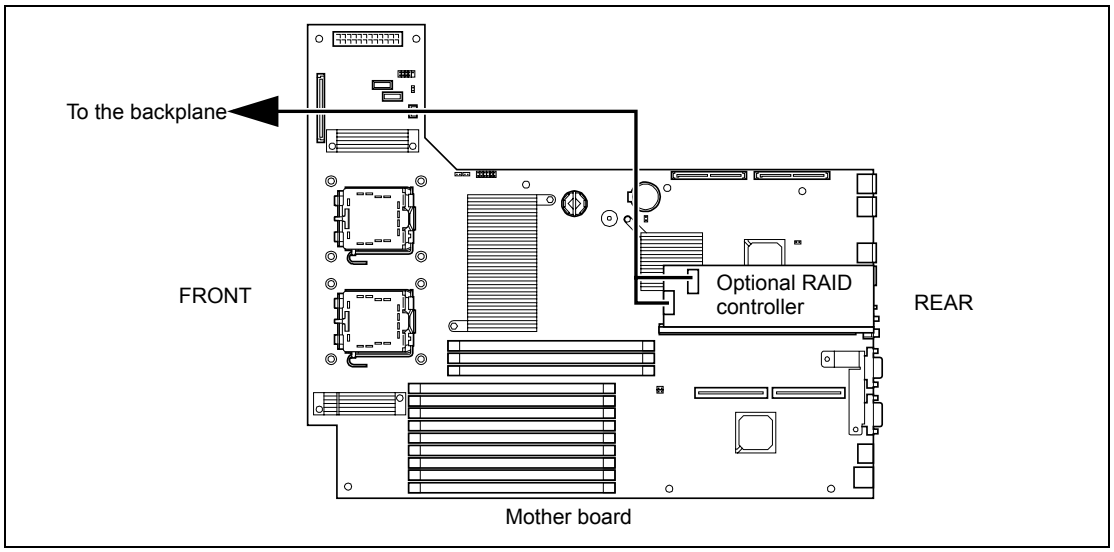
Your server can include the optional PCI add-in RAID controller. The optional RAID controller can control the internal hard disk drives as the RAID drive.

To use the internal hard disk drives in a disk array configuration with an optional RAID controller, reconnect the SCSI cable on the mother board (excluding the zero-channel RAID card (N8103-99)). At the factory, the internal SCSI cable is connected to the serial SCSI (SAS) interface connectors on the mother board as shown below.



Change the SCSI cable connection as the following procedures.

1. Remove the end of the SCSI interface cable that is plugged into the SAS connectors on the mother board.
2. Reinstall the end of the SCSI interface cable just removed into the connector on the RAID controller.

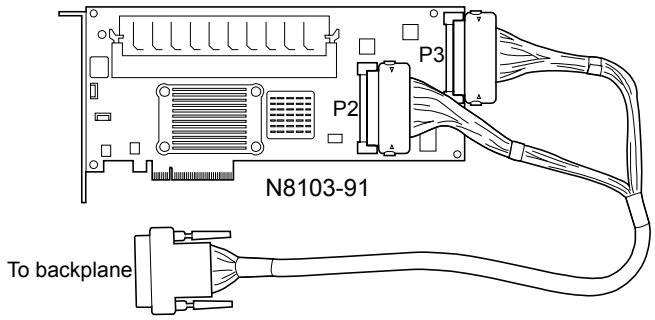


3. Replace the parts and covers, plug in the system power cord, and turn on the system to run the RAID utility (refer to the manual that comes with the optional RAID controller).

IMPORTANT:

Notes on Using the N8103-91 disk array controller (internal SAS HDD)

- Pay attention to connect the interface cable to proper cable connectors P2 and P3. Otherwise, the SAS port number for hard disk drive may not be displayed correctly (see figure below).



- Connect the cables to the disk array controller before installing the PCI riser module assembly to the chassis.

Notice

Observe the following notes on configuring a disk array:

- The installed hard disk drives must the same capacity and the same rotational speed. (The minimum number of required disks depends on the configuration of RAID (Redundant Arrays of Inexpensive [Independent] Disks).)
- Select/set a RAID level "RAID0", "RAID1", or "RAID5 (optional RAID controller only)" of disk array configuration.

When installing a system in an internal hard disk drive, you should use "Express Setup" to perform all the procedures for RAID configuration, OS installation, and then OS setup.

Use Express Setup even when not installing a system. Start Express Setup, select [OS Selection] → [Others]. The installer automatically performs all the procedures for RAID configuration, maintenance partition setting, and then maintenance utility installation.

When making the setup in manual mode, use the RAID configuration utility in the chip on the board. You can start the utility during execution of POST that automatically starts immediately after you turn on the server power switch. For details, see the online document in the NEC EXPRESSBUILDER CD-ROM provided with the server. (The utility varies depending on the disk array controller board.) For details on the data transfer rate, RAID, and array configuration, see the manual provided with the disk array controller board as well as the online document.

Disk Expansion Unit

A disk expansion unit is an exclusive device that can install up to 14 hard disk drives. (The number of hard disk drives depends on the model.) The server containing a disk array controller board can connect one or two of these devices. For details on the number of devices connected, see the manuals provided with the disk array controller and disk expansion unit.

> **IMPORTANT:** A disk expansion unit is provided with no hard disk drives. You need to purchase hard disk drives separately.

An optional cable may be required to connect with a disk expansion unit. Refer to the manual coming with the disk expansion unit for details.

After connecting the disk expansion unit, use the RAID configuration utility in the chip on the board to set the disk expansion unit in a disk array configuration (RAID0, RAID1, or RAID5). (The utility varies depending on the board.) For details on settings and the setting methods, see the online document in the NEC EXPRESSBUILDER CD-ROM provided with the server or the manual provided with the board.

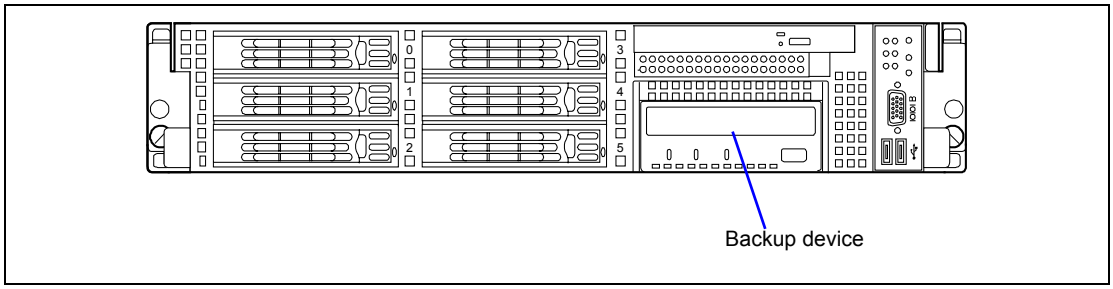
While a disk expansion unit is set in a disk array configuration, you can use the "Auto Rebuild" feature of the disk array controller to restore data if one of the hard disk drives installed in the disk expansion unit fails. (Replace the failing hard disk drive while the power is on. (Hot swapping))

BACKUP DEVICE

The server has one slot for installing a backup device such as a magnetic tape drive.

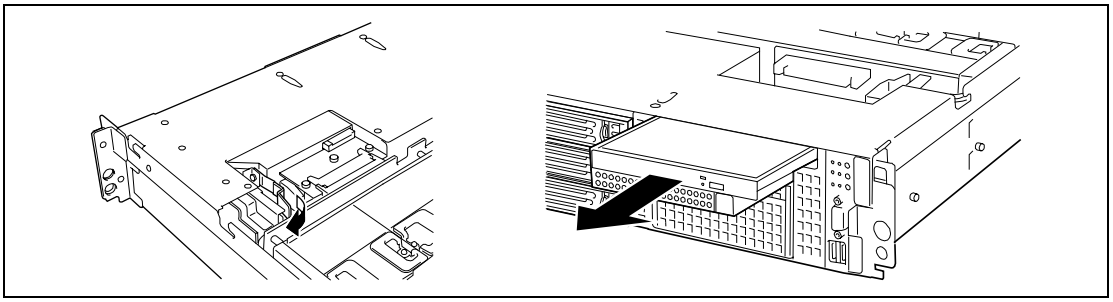
IMPORTANT:

- A SCSI cable K410-147(00) and PCI SCSI controller card are necessary for installing a SCSI backup device.
- Set "OFF" for the terminating resistor of the backup device you are going to install, and set a SCSI ID different from those of other devices. For the settings, see the manual provided with the server.
- Install only a backup device specified by NEC.
- The size of a backup device which can be installed in this server is as follows:
  Width: Up to about 9 cm (3.5 inches)
  Height: Up to about 4 cm (1.6 inches)



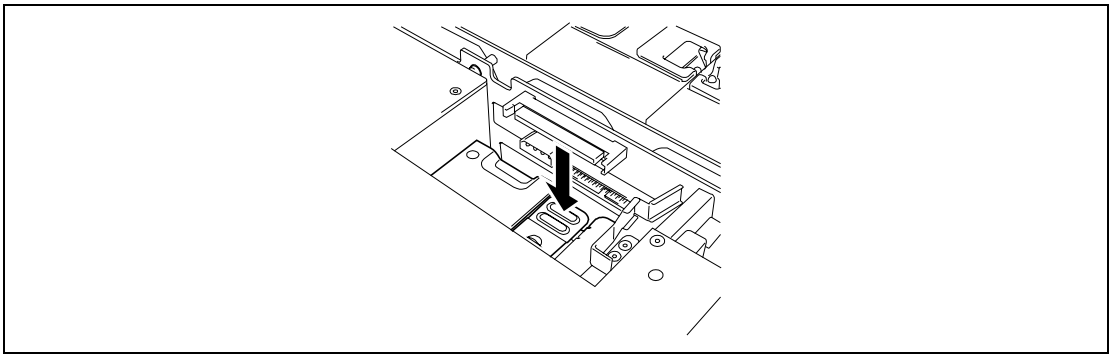
Installation (IDE File Devices)

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Remove the drive cover.
4. While pulling the lever toward the right side of the server, pull the DVD-ROM drive out of the chassis.



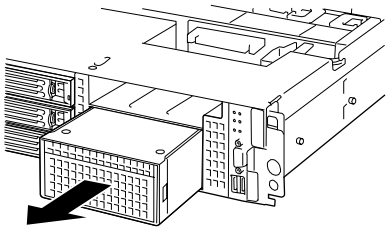
IMPORTANT: Do not touch any other part than release lever when removing the DVD-ROM drive. Otherwise, your fingers may be caught.

5. While pushing the latching tab that secures the device bay, push the device carrier out of front of the server.

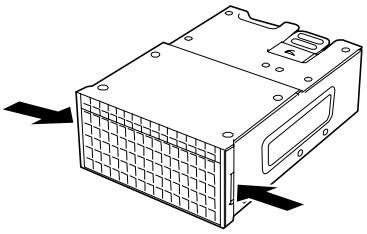


IMPORTANT: Be careful not to bend the latching tab by applying excess force. If the tab bends, straighten it out as it was.

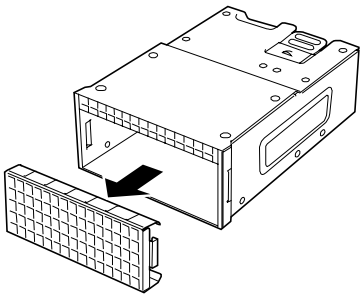
6. Take out the device carrier from the front of the server.



7. Push the tabs at both ends of the front panel.

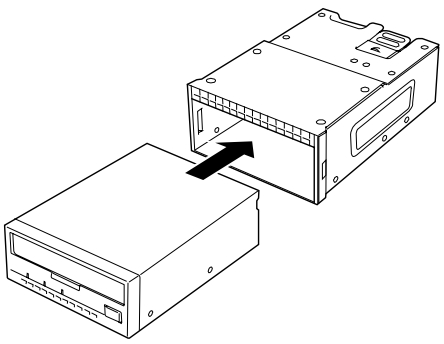


8. Remove the front panel.

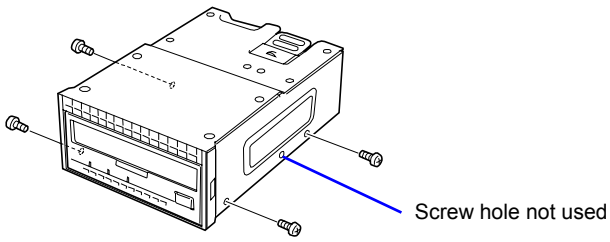


IMPORTANT: Keep the removed front panel for future use.

9. Insert the backup device into the device carrier.



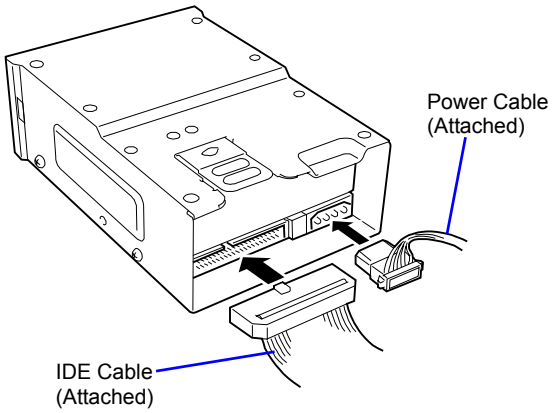
10. Secure the backup device with the provided screws.
Tighten two screws on each side.



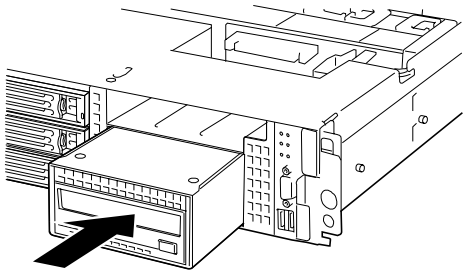
NOTES:

- Be sure to use the screws provided with the backup device.
- Position the backup device so that the device screw holes align with the screw holes in the device carrier.
- If you feel difficult to connect the cable of the long device, slide the device to the front and then connect the cable.

11. Connect the power extension cable and interface cable to the device.

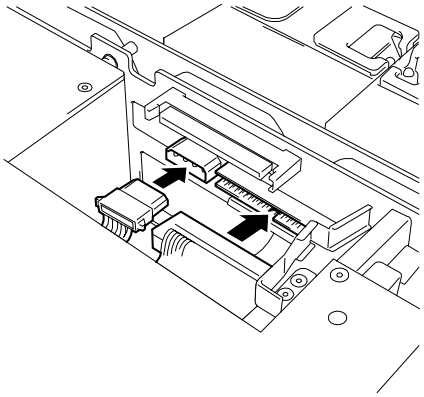


12. Insert the device carrier into the backup device bay halfway.



NOTE: Be careful not to catch the connected power extension cable in inserting the device carrier.

13. Connect the interface cable and power cable to the backplane as shown in figure below.



14. Insert the device carrier into the device bay until it locks.

It is locked when a "click" is heard.

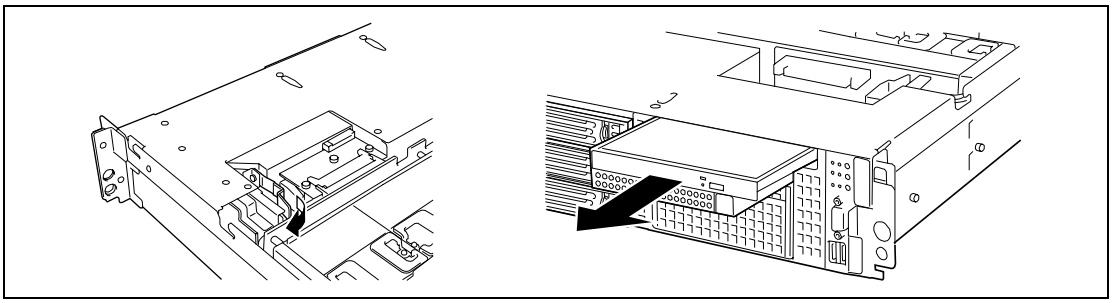
15. Install the components you removed previously.

16. Install the device driver.

Refer to the manual that comes with the device.

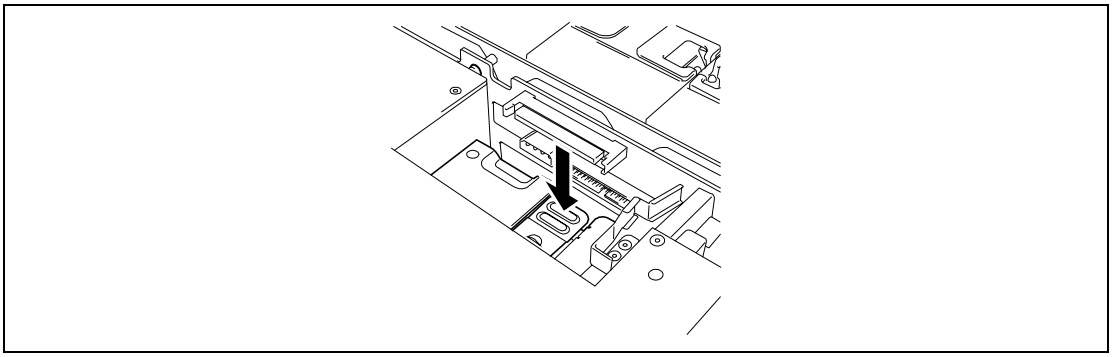
Installation (SCSI File Devices)

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Remove the drive cover and logic cover.
4. Remove the PCI riser module assembly (see "PCI board" described earlier in this chapter).
5. Remove the support arm and processor duct (see "CPU" described earlier in this chapter).
6. While pulling the lever toward the right side of the server, pull the DVD-ROM drive out of the chassis.



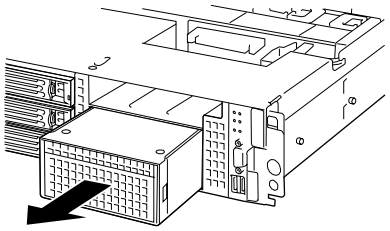
IMPORTANT: Do not touch any other part than release lever when removing the DVD-ROM drive. Otherwise, your fingers may be caught.

7. While pushing the latching tab that secures the device bay, push the device carrier out of front of the server.

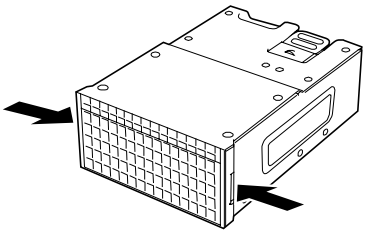


IMPORTANT: Be careful not to bend the latching tab by applying excess force. If the tab bends, straighten it out as it was.

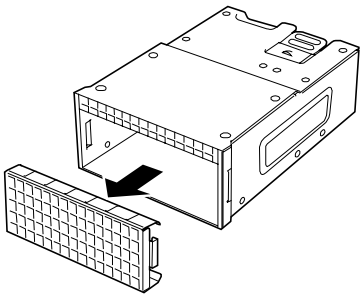
8. Take out the device carrier from the front of the server.



9. Push the tabs at both ends of the front panel.

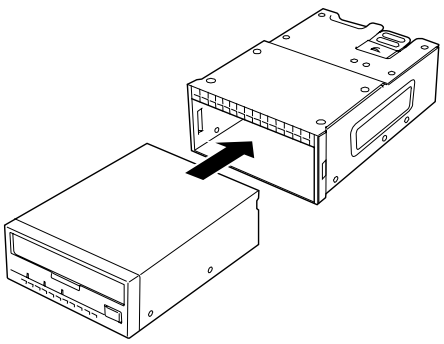


10. Remove the front panel.

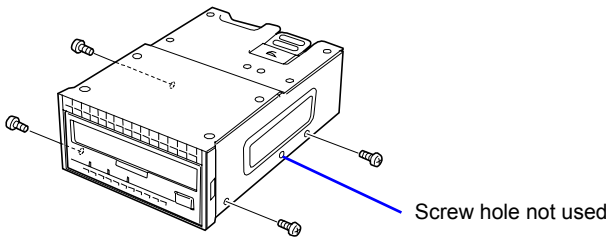


IMPORTANT: Keep the removed front panel for future use.

11. Insert the backup device into the device carrier.



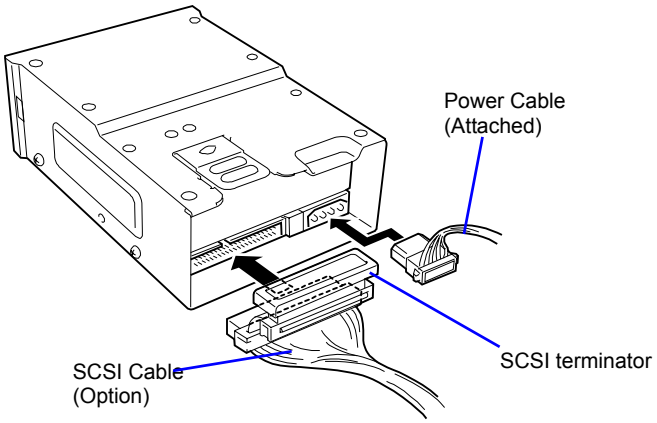
12. Secure the backup device with the provided screws.
Tighten two screws on each side.



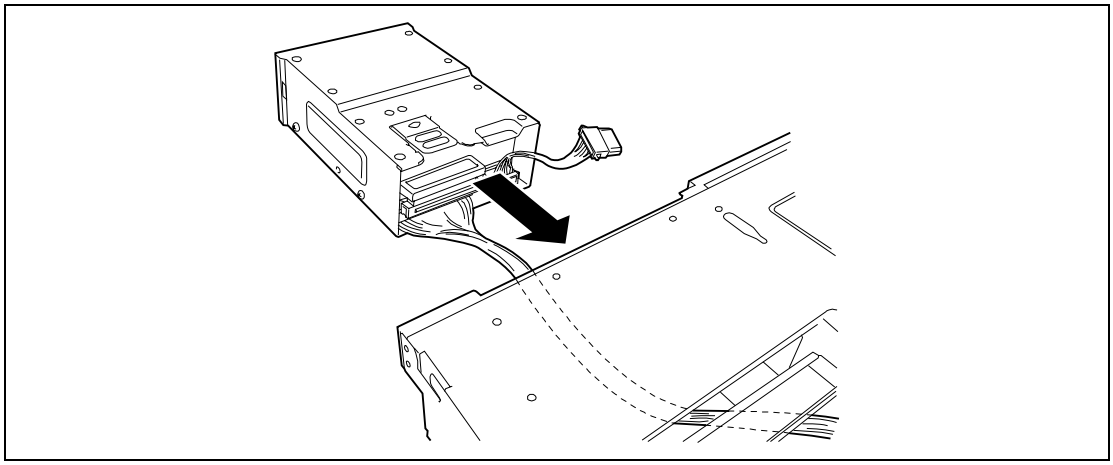
NOTES:

- Be sure to use the screws provided with the backup device.
- Position the backup device so that the device screw holes align with the screw holes in the device carrier.
- If you feel difficult to connect the cable of the long device such as N8151-54F internal AIT, slide the device to the front and then connect the cable.

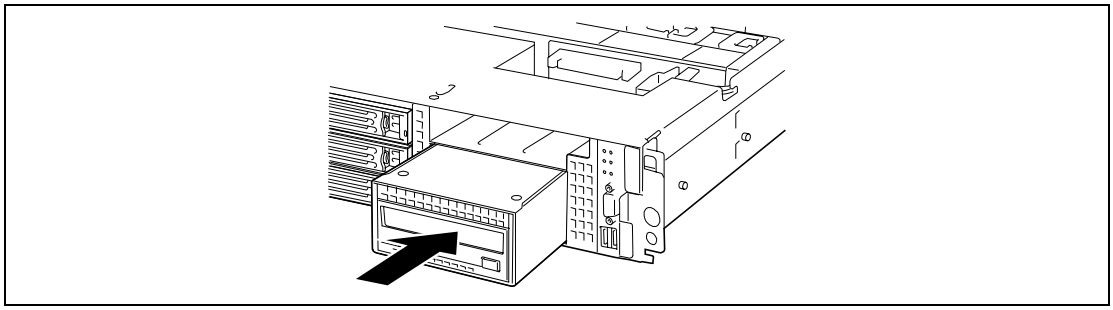
13. Connect the power extension cable and interface cable to the device.



14. Insert the SCSI cable into the server from the front of the server (see figure below).

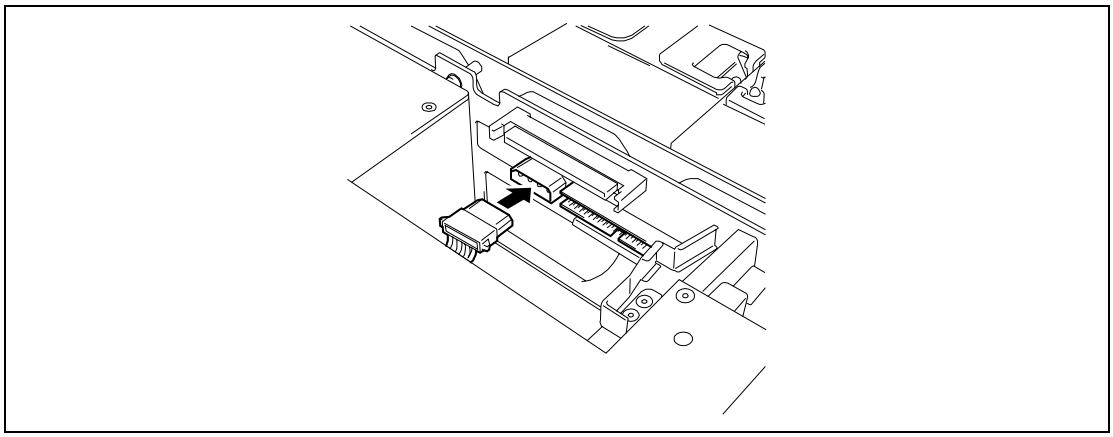


15. Insert the device carrier into the backup device bay halfway.

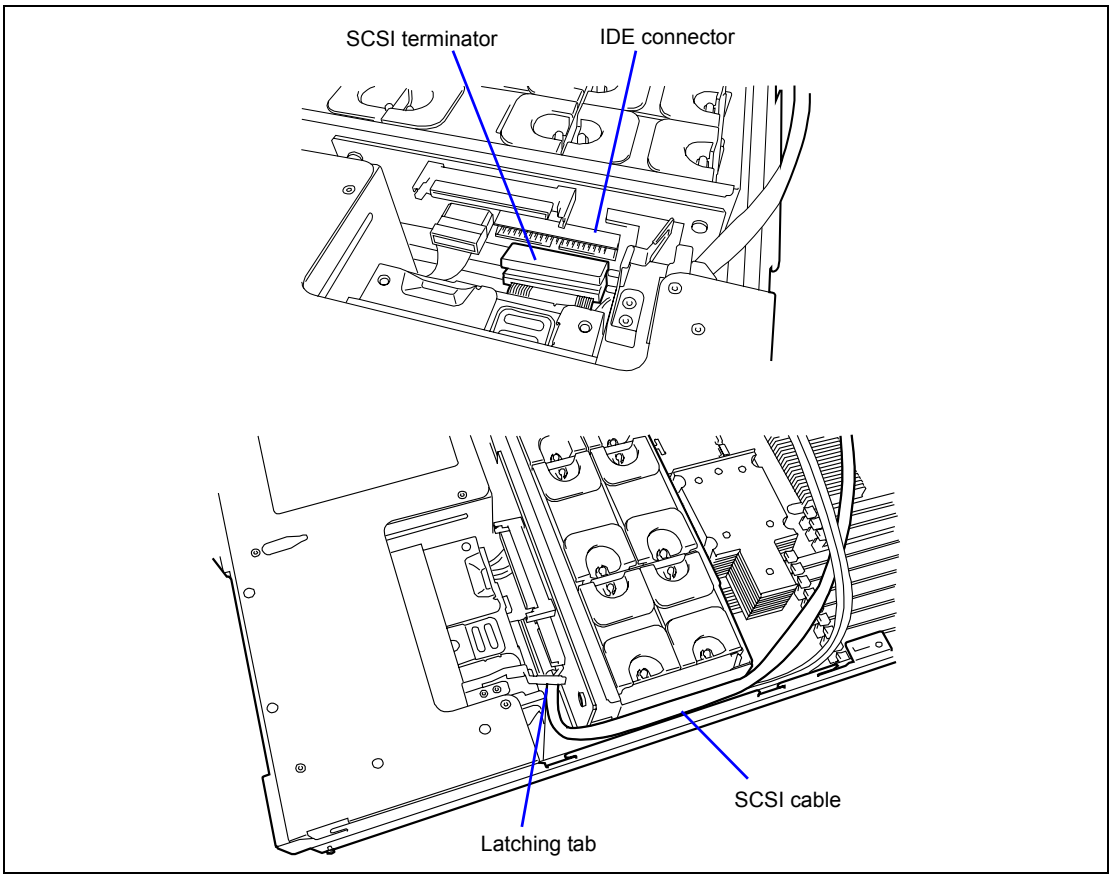


NOTE: Be careful not to catch the connected power extension cable in inserting the device carrier.

16. Connect the power cable to the backplane as shown in the figure below.



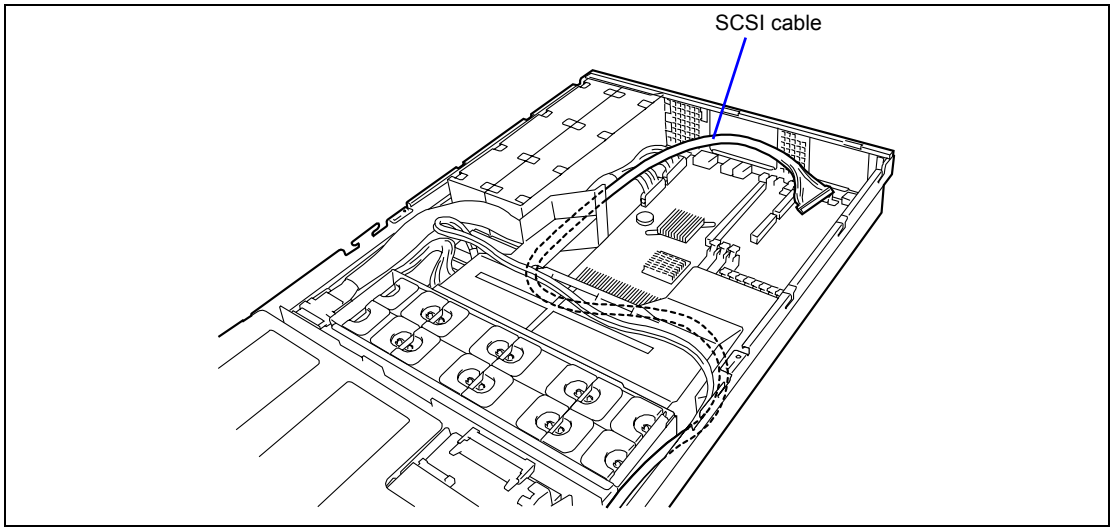
NOTE: Confirm where to place the terminator at the end of the SCSI cable. The terminator must be placed in the device bay. At this time, also confirm that the SCSI cable is not in contact with the latching tab of the device carrier. This is to prevent the cable from being damaged.



17. Insert the device carrier into the device bay until it locks.

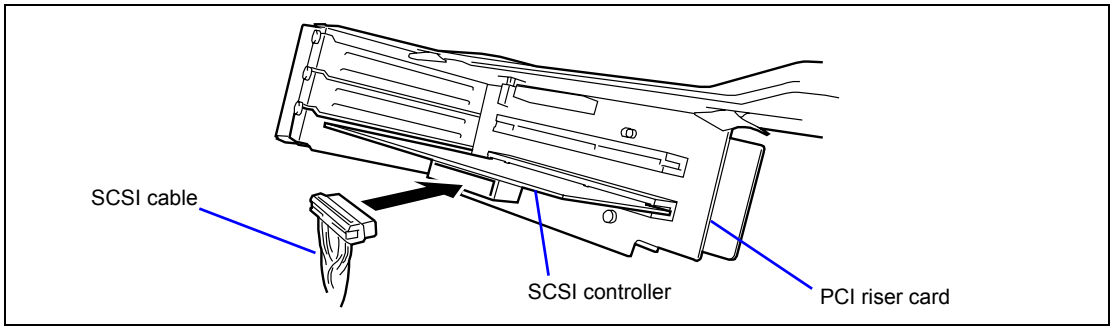
It is locked when a "click" is heard.

18. Route the SCSI cable as shown in figure below.



19. Install the optional SCSI controller to the PCI riser card.

20. Connect the SCSI cable to the SCSI connector on the SCSI controller.



21. Reinstall the PCI riser module assembly to the chassis.

22. Install the components you removed previously.

23. Configure the SCSI device and install the device driver.

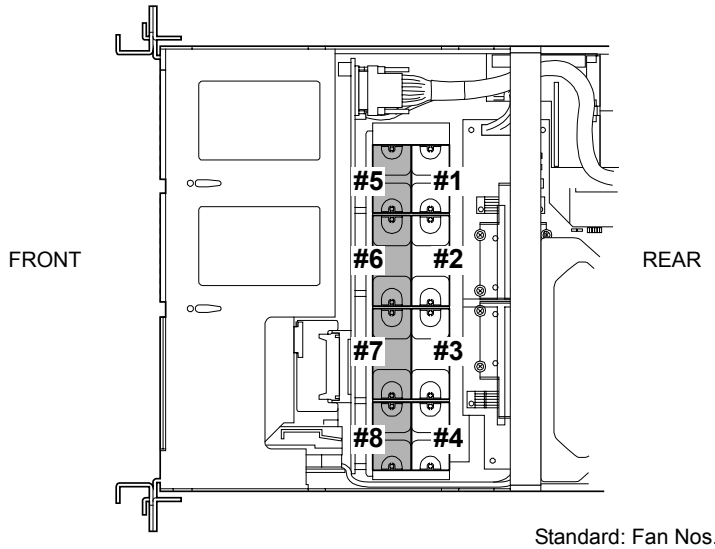
Refer to the manual that comes with the device.

Removal

Remove the backup device in reverse order of the installation steps.

REDUNDANT HOT SWAP-FAN

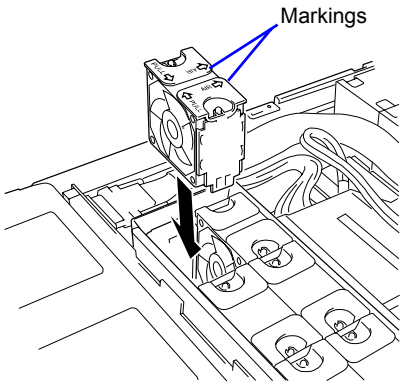
Your server can include four optional redundant hot-swap fans.



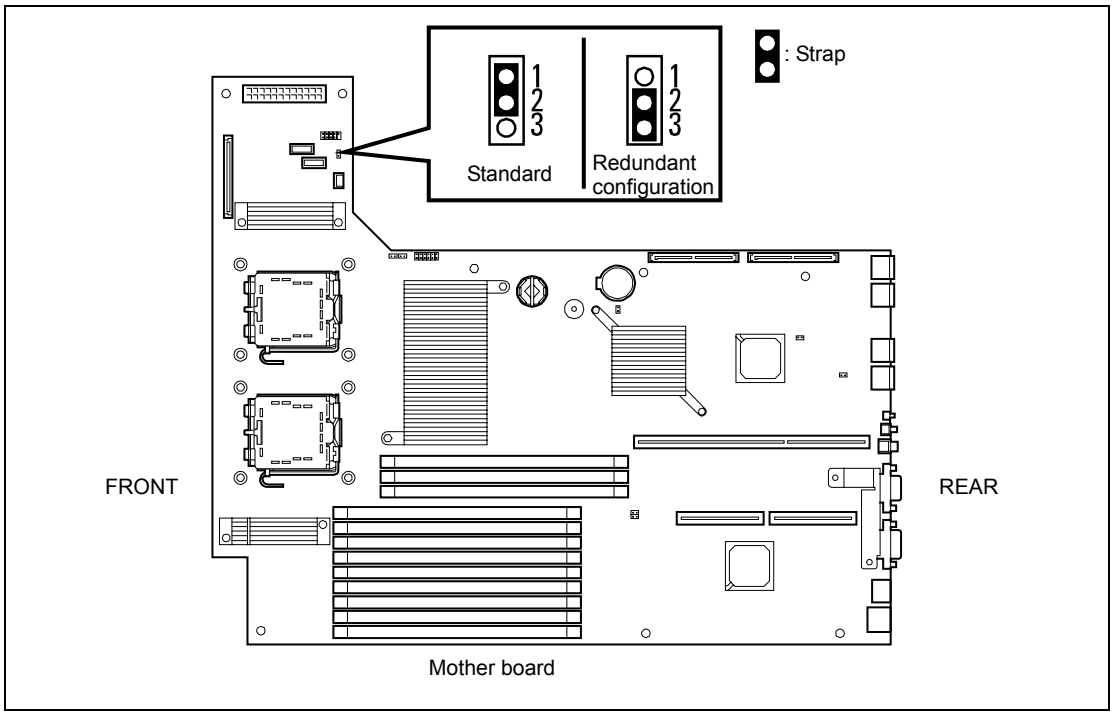
Standard: Fan Nos. #1, #2, #3 and #4.
Option: Fan Nos. #5, #6, #7 and #8

Installation

1. See the section "Preparing for Installation and Removal" described earlier to prepare.
2. Pull out the server from the rack.
3. Remove the drive cover.
4. Locate the installation slot.
5. Hold the fan with the "AIR⇨" direction facing the rear of the server as shown in the figure below.



6. Insert the hot-swap fan into the slot until it locks.
7. Change the Redundant fan jumper setting as shown in the figure below.



IMPORTANT: To avoid system malfunction, leave other jumpers at its default position.

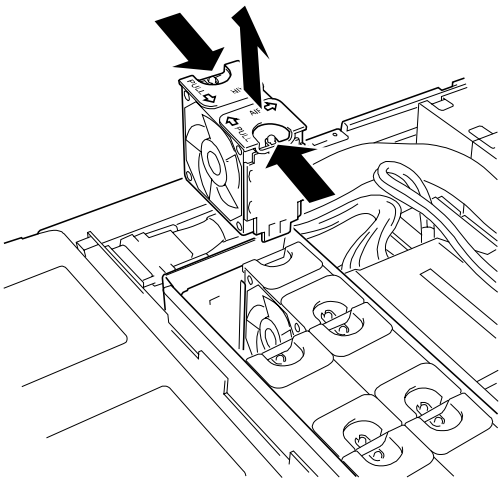
8. Install the components you removed previously.

Removal

Follow these steps to remove or replace the hot-swap fan.

1. Pull out the server from the rack.
2. Remove the drive cover.
3. Locate the failed fan.

   Fault LED on the fan turns on when a fan failure occurs. A fan failure is also indicated by NEC ESMPRO and system event log.
4. While pressing release tabs on the top of the fan, pull the fan up to remove from the fan slot.



5. Install the new fan into the vacant slot.

   IMPORTANT: If all the redundant fans are removed. Change the redundant fan jumper setting described earlier in the installation procedure.

6. Install the components you removed previously.

Appendix A

Specifications

Item			NEC Express5800/120Ri-2			
			N8100-1247F	N8100-1333F	N8100-1334F	N8100-1248F
CPU	Type		Intel® Xeon® processor			
	Clock/Cache		1.60GHz/4MB	2.00GHz/4MB	2.33GHz/4MB	3.00GHz/4MB
	Standard		1			
	Maximum		2			
Chipset			Intel 5000P (1066/1333MHz)			
Memory	Minimum		2GB (1GB×2)			
	Maximum		48GB (The standard DIMM must be replaced.)			
	Expansion unit		2 DIMMs (512MB/1GB/2GB/4GB)			
	Expansion times		6 times			
	Memory module		SDRAM DIMM (Low Profile DDR2-533 Full-Buffered Type)			
	Error check		ECC			
Graphics (VRAM)			VRAM: 16MB			
Auxiliary input device	Floppy disk (option)		3.5-inch drive × 1 (USB)			
	Hard disk (standard)		None			
	Hard disk (maximum)		1.8TB (300GB × 6)			
	DVD-ROM (standard)		ATAPI interface × 1 (Load on tray type, x24 speed)			
Additional bay	Hard disk drive bay		6 slots			
	3.5-inch bay		1 slot			
PCI slot	Full-height		PCI EXPRESS (x8) × 1 slot, PCI-X (64-bit/100 MHz) × 2 slots			
	Low Profile PCI		PCI EXPRESS (x8) × 1 slot, PCI EXPRESS (x4) × 2 slots			
LAN interface			2 ports (1000Base-T/100Base-TX/10Base-T) and 1 management port (100Base-TX/10Base-T)			
External interface	Keyboard/mouse		MINI DIN 6-pin connector (1 port)			
	USB		4-pin (4 ports, 2 at front panel, 2 at rear panel)			
	Serial		2 ports, (D-sub 9-pin)			
	Network		RJ-45 (2 ports)			
	Display		MINI D-sub 15-pin (1 port)			
	SCSI		Option			
Cabinet design			Rack-mount type (2U)			
External dimensions			427 (width) × 88 (height) × 722 (depth) mm			
Weight (Max.)			21 kg (30 kg)			
Power supply			100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz			
Environmental requirements		Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)			
		Humidity	20 to 80% RH (no condensation)			
Others			NEC EXPRESSBUILDER supported, NEC ESMPRO provided in the standard configuration			

Item			NEC Express5800/120Ri-2	
			N8100-1319F	N8100-1320F
CPU	Type		Intel® Xeon® processor	
	Clock/Cache		2.33GHz/2x4MB	2.66GHz/2x4MB
	Standard		1	
	Maximum		2	
Chipset			Intel 5000P (1066/1333MHz)	
Memory	Minimum		2GB (1GB×2)	
	Maximum		48GB (The standard DIMM must be replaced.)	
	Expansion unit		2 DIMMs (512MB/1GB/2GB/4GB)	
	Expansion times		6 times	
	Memory module		SDRAM DIMM (Low Profile DDR2-667 Full-Buffered Type)	
	Error check		ECC	
Graphics (VRAM)			VRAM: 16MB	
Auxiliary input device	Floppy disk (option)		3.5-inch drive × 1 (USB)	
	Hard disk (standard)		None	
	Hard disk (maximum)		1.8TB (300GB × 6)	
	DVD-ROM (standard)		ATAPI interface × 1 (Load on tray type, x24 speed)	
Additional bay	Hard disk drive bay		6 slots	
	3.5-inch bay		1 slot	
PCI slot	Full-height		PCI EXPRESS (x8) × 1 slot, PCI-X (64-bit/100 MHz) × 2 slots	
	Low Profile PCI		PCI EXPRESS (x8) × 1 slot, PCI EXPRESS (x4) × 2 slots	
LAN interface			2 ports (1000Base-T/100Base-TX/10Base-T) and 1 management port (100Base-TX/10Base-T)	
External interface	Keyboard/mouse		MINI DIN 6-pin connector (1 port)	
	USB		4-pin (4 ports, 2 at front panel, 2 at rear panel)	
	Serial		2 ports, (D-sub 9-pin)	
	Network		RJ-45 (2 ports)	
	Display		MINI D-sub 15-pin (1 port)	
	SCSI		Option	
Cabinet design			Rack-mount type (2U)	
External dimensions			427 (width) × 88 (height) × 722 (depth) mm	
Weight (Max.)			21 kg (30 kg)	
Power supply			100 to 120 VAC ±10%, 200 to 240 VAC ±10%, 50/60 Hz ±1 Hz	
Environmental requirements		Temperature	10 to 35°C (operating), -10 to 55°C (non-operating, storage)	
		Humidity	20 to 80% RH (no condensation)	
Others			NEC EXPRESSBUILDER supported, NEC ESMPRO provided in the standard configuration	

Appendix B

Other Precautions

Transfer Rate of the On-board LAN Controller

The mother board includes the two network interface controllers that supports 10Base-T, 100Base-TX, and 1000Base-T networks and a capable of full or half duplex.

The both controllers can automatically detect and switch for network speed and transfer mode connected to the HUB. However, for proper network operation, specify the "Link Speed & Duplex" value the same as the value specified for HUB.

Server Management Software

The NEC EXPRESSBUILDER CD-ROM that comes with the server contains the NEC ESMPRO utility.

NEC recommends that you should install the NEC ESMPRO for effective use of the reliability enhancement features of the server.

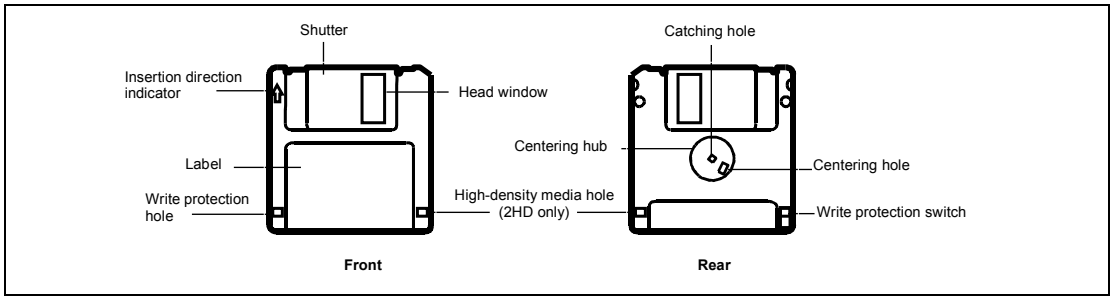
Floppy Disk

The following describes use of the floppy disk.

Floppy disk type

The server uses 3.5-inch floppy disks. You can use the following two types of 3.5-inch floppy disks:

- 2HD floppy disk (double-sided high-density track type)
  Stores data of 1.44MB.
- 2DD floppy disk (double-sided double-density track type)
  Stores data of 720KB.



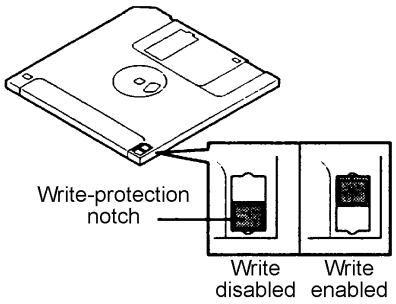
Notes on use

The floppy disk is an important data storage media with delicate structure and requires care. Keep the following notes in mind to use it:

- Insert the floppy disk into the floppy disk drive gently as far as it goes.
- Attach the label to the correct position.
- Do not write anything directly onto the disk surface with a pencil or ball-point pen.
- Do not open the shutter.
- Do not use the floppy disk in a dusty place.
- Do not place anything on the floppy disk.
- Do not leave the floppy disk in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- Do not leave the floppy disk with foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the floppy disk near any form of liquid or a chemical or in a place where a chemical may be accidentally sprayed over them.
- Do not place any magnetic objects (e.g., magnet) near the floppy disk.
- Do not clip the floppy disk or drop it.
- Keep the floppy disk in a floppy disk case that protects it from magnetism and dust.

- Write-protection

  A floppy disk has a write-protect switch that prevents the stored data from accidental erasure.



  You can read data from a write-protected floppy disk, but you cannot save data into the floppy disk or format it. NEC recommends that you should write-protect any floppy disk containing valuable data unless you are about to save data.

  To write-protect a 3.5-inch floppy disk, use the write-protect switch provided on its back.

- Disk format

  To write data into a floppy disk, the floppy disk must be "formatted." "Formatting" is to initialize the floppy disk and make it available for the system environment (operating system).

  IMPORTANT:

  - Formatting a used floppy disk clears all the data contained in it, if any.
  - Formatting a floppy disk from the DOS command line is not available with the server. Use a formatted floppy disk to work with it on the DOS command line.

  The format method depends on your operating system. Refer to the manual that comes with your operating system for details.

- Data backup

  "Data backup" is to copy data stored in a media into another media (e.g., floppy disk, digital audio tape, or magnet-optical disk).

  IMPORTANT: Make sure to make a back-up copy of every floppy disk, if provided.

  The floppy disk is a very delicate storage media. Dust or thermal changes, as well as operator's misconduct or server failures, may cause loss of data. To avoid loss of data, NEC recommends that you should make a back-up copy of your valuable data on a regular basis.

CD/DVD Discs

Keep the following notes in mind to use the disc for the server:

- Press the center of the storage case to remove the disc from the case.
- Do not drop the disc.
- Do not place anything on the disc or bend the disc.
- Do not attach any label onto the disc.
- Do not touch the signal side (nothing is printed on this side) with your hand.
- Place the disc with its printed side upward and gently put it on the tray.
- Do not scratch the disc or write anything directly on it with a pencil or ball-point pen.
- Do not leave the disc with foods and drinks, or in a place exposed to cigarette smoke.
- Do not leave the disc in a high-temperature place (e.g., place exposed to direct sunlight or close to a heater).
- When dust or fingerprints are attached on the disc, wipe the disc from its center to edge with a dry soft cloth slowly and gently.
- Use the disc cleaner to clean the disc. Do not use record spray/cleaner, benzene, or thinner.
- Keep the disc in a disc case when not in use.

Tape Media

The following describes data handling with the DAT, DLT, or AIT optionally available for the server.

- Saving your valuable data

  When you save your valuable data or programs into the cartridge tape, you should save them into two cartridge tapes to make the primary and secondary tapes.

  This enables you to restore your data from one tape when the other makes a read error, as well as to protect your valuable data and programs from loss.

- Three-generation data management

  NEC recommends that you should employ three-generation data management for data storage.

  Three-generation data management uses three cartridge tapes: A, B, and C. You save data to tape A on the first day, tape B on the second day, tape C on the third day, tape A on the forth day, and so on. That is, you save data into cartridge tapes cyclically from tape A through C.

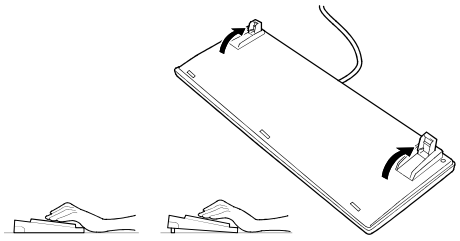
This enables you, for example, to use tape B to restore the data when tape C makes a read error. Also when both tapes B and C make a read error, you can restore your valuable data by using the data stored in tape A.

Keyboard

The keyboard is a device to instruct you computer by entering alphanumeric characters or symbols.

IMPORTANT:

- Do not pour any liquid such as water or put anything into the keyboard. Doing so may cause a failure of the keyboard.
- The keyboard provided with the server is designed for adjustment of an angle. Adjust the keyboard angle at which the keyboard is easy to operate. The adjustment assists in reducing strain on your shoulders, arms, and fingers.



NOTE: The keyboard functions depend on the software. Refer to the manual that comes with the software for details.

Mouse

Like the keyboard, the mouse is a device to instruct your computer. Many OS's and application software require the mouse for operation.

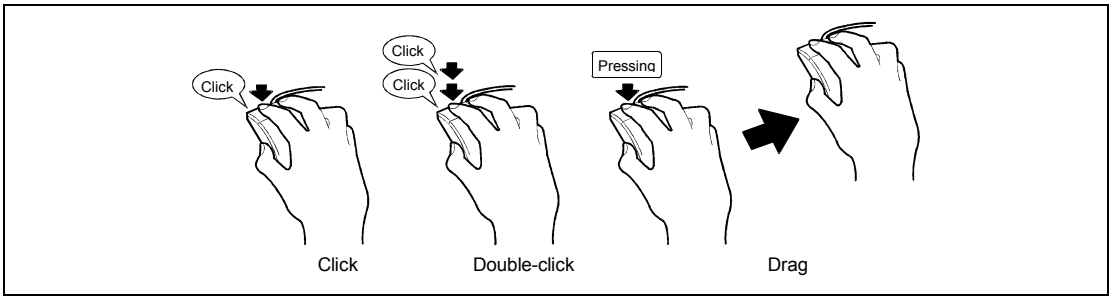
NOTE:

- Functions assigned to the mouse buttons vary depending on the software. For details, refer to the manual provided with the software.
- Use the mouse on a clean desk. Using the mouse on a dusty or dirty desk disturbs smooth movement or normal operation of the mouse. When your mouse movement seems dull, clean your mouse. (See Chapter 7.)

Mouse operation includes "Click," "Double-click," and "Drag."

Click:	Press the button only once and release it.
Double-click:	Press the button twice consecutively and release it.
Drag:	Press and hold the button and move the mouse.

Operation of the server involves combinations of these mouse operations and data entries with the keyboard.



Appendix C

IRQ

The factory-set interrupt requests is listed below. Find an appropriate one to install an optional device.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	12	Mouse
1	Keyboard	13	Numeric processor
2	–	14	Primary IDE
3	COM2 serial port	15	Secondary IDE
4	COM1 serial port	16	USB
5	PCI	17	VGA
6		18	–
7	PCI	19	USB
8	Real-time clock	30	LAN1
9	ACPI compliant system	31	LAN2
10	PCI	49	Onboard SAS 1
11	BMC IRQ	50	Onboard SAS 2

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Appendix D

Installing Windows Server 2003 x64 Editions

This section explains how to install the Windows Server 2003 x64 Editions.

NOTICE

Read the following notes or information before installing the Windows Server 2003 x64 Editions.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER CD-ROM attached to your server supports the following optional boards;

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed below, see "Installing with the OEM-FD for Mass storage device" and "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6.

- Controllers supporting installation of OS with Express Setup
  - N8103-91 Disk Array Controller (Internal SAS HDD)*
  - N8103-99 Disk Array Controller (0ch)*
  - LSI Logic Embedded MegaRAID™ (embedded on the mother board)
- Other controllers
  - N8103-80F Disk Array Controller (SCSI 1ch)*
  - N8103-81F Disk Array Controller (SCSI 2ch)*
  - N8103-75 SCSI Controller*
  - N8103-95 SCSI Controller*
  - N8190-126 SCSI Controller*

* Option.

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Updating System

If you modified the Windows system, execute "Update Express5800 system" in Master Control Menu.

Re-installing to the Hard Disk which has been upgraded to Dynamic Disk

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

Manual Installation when N8103-80F/81F Keeps Connection

If you keep those controllers connecting during installation process, pop-up messages may appear. This does not affect on system behavior. Click [YES] and continue the installation. Follow the message hereafter.

Mounting MO Device

Do not mount an MO device on your server during the Windows installation.

About Removable Media

Do not set removable media, such as DAT, into the device mounted on your server during the OS installation.

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive if necessary.

Creating Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system	+ Paging File Size + Dump File Size + Application Size
Size necessary to install the system	= 4100MB
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump file Size	= Mounted Memory Size + 1MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- Regardless of the size of the mounted memory, or the Write debugging information (type of memory dump), the maximum size of the dump file is 'The size of the mounted memory + 1MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

4100MB + (512MB * 1.5) + (512MB + 1MB) + Application Size
= 5381MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

INSTALLING WINDOWS SERVER 2003 X64 EDITIONS

Preparations for Installation

- NEC EXPRESSBUILDER CD-ROM
- Microsoft Windows Server 2003 R2 Standard x64 Edition (CD-ROM) / Microsoft Windows Server 2003 R2 Enterprise x64 Edition (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER diskette

Creating "Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER diskette.

> **NOTE:** If you have already "Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows Server 2003 x64 Edition, you do not need to create it again.

You can create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER with the following two procedures.

- Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

  If you have only NEC Express5800 Server to create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER, use this procedure.

  If Windows Server 2003 can be operated on NEC Express5800 Server, you can use the other procedure described later.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Turn on your NEC Express5800 Server.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive of the server.
4. Press **Ctrl** + **Alt** + **Delete** to reboot the server .(You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.
5. Select [Create Support Disk] from [Tools].
6. Select [Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER] from [Create Support Disk] menu.

7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

   Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

■ Create from [Master Control Menu]

[Master Control Menu] runs on the following operating systems.

- Windows Server 2003 x64 Editions
- Windows Server 2003
- Windows XP x64 Edition
- Windows XP
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0

You can create Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

8. Prepare one 3.5-inch floppy disk.
9. Run the operating system.
10. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive of the server.

    [Master Control Menu] will appear.

11. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows Server 2003 x64 Edition].

    NOTE: You can do the same operation with the menu appeared by the Right-click.

12. Insert the floppy disk into the floppy disk drive according to the message.

    Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER will be created.

    Write-protect and attach a label, then keep it safely.

Windows Server 2003 x64 Editions Clean Installation

This section explains how to perform a clean installation of Windows Server 2003 x64 Editions.

1. Turn on the system power.
2. Insert the Windows Server 2003 x64 Edition CD-ROM into the DVD-ROM drive.
3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

   After a bootable operating system has been installed on the hard disk, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

   If no bootable operating system exists on the hard disk, this step is unnecessary.

   The Windows Server 2003 x64 Editions setup screen will appear.

   If the screen is not displayed, **Enter** was not pressed properly.

   Begin after turning on the system power again.
4. If the RAID controller or SCSI controller is installed in the system, press **F6** in a few seconds when the window is in either of the following states.
   - "Setup is inspecting your computer's hardware configuration ..." is displayed.
   - A screen with a solid blue background is displayed.

   IMPORTANT: There is no visible indication on screen when **F6** has been pressed.
5. When the following message is displayed, press **S**.

   ```
   Setup could not determine the type of one or more mass storage devices
   installed in your system, or you have chosen to manually specify an adapter.
   Currently, Setup will load support for the following mass storage devices.
   ```

   The following message is displayed.

   ```
   Please insert the disk labeled
   manufacturer-supplied hardware support disk
   into Drive A:
   *Press ENTER when ready.
   ```
6. Insert the Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

   A list of mass storage devices is displayed.
7. Select the [LSI Logic Fusion-MPT SAS Driver (Server 2003 x64)] and press **Enter**.

8. Select the proper SCSI Adapter and press **Enter**.
   - [LSI Logic MegaRAID SAS RAID Controller Driver (Server 2003 for x64)](When N8103-91 board is installed.)
   - [LSI Logic MegaRAID SAS RAID Controller Driver (Server 2003 for x64)](When N8103-99 board is installed.)
   - [LSI MegaRAID Software RAID (Windows XP/2003 64-bit)] (When LSI Logic Embedded MegaRAIDTM is used.)

   Continue performing tasks according to the subsequent messages that appear.
9. When the following message is shown, press **Enter** to start "Welcome to Setup".
10. When the installation of Windows Server 2003 x64 Edition has finished, the system reboots automatically.
11. The [Windows Setup] screen will be displayed after logged on to the system.

Windows Setup
Windows Setup is not complete. We recommend that you continue Setup so that you can install the additional components that are available in this version of the Windows Server operating system.
For more information about the new components, see the documentation on Windows Server CD 2.
To continue Setup, insert Windows Server CD 2, or specify the location where the Windows Server CD 2 files are stored, and then click OK.
Location of Windows Server CD 2 files:
D:\
Browse...
OK
Cancel

IMPORTANT:

- In this case, the [Windows Setup] screen may not be displayed.
  Be sure to install Microsoft Windows Server 2003 R2 x64 Edition DISC 2 according to the following procedures.
- You can install Microsoft Windows Server 2003 R2 x64 Edition DISC 2 after the application of "System update".
  Be sure to install Microsoft Windows Server 2003 R2 x64 Edition DISC 2.
  In this case, note that the [Windows Setup] screen is not displayed.

12. Insert Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM into the DVD-ROM drive.

Confirm the parameters and click [OK].

13. When the installation has completed, remove Microsoft Windows Server 2003 R2 x64 Edition DISC 2 CD-ROM from the DVD-ROM drive, and restart the system.

After installation is completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of this chapter.

Reinstallation to Multiple Logical Drives

This subsection describes the procedure for reinstalling the operation system if the multiple logical drives exist.

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this chapter.
2. Specify the partition in which you want to install the operating system when the following message appears:

   ```
   The following list shows the existing partitions and
   unpartitioned space on this computer.

   Use the UP and DOWN ARROW keys to select an item in the list.
   ```

   * Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation again following the procedure described earlier in this chapter.

   The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, modify it according to the "Procedure for Modifying the Drive Letter".

Procedure for Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot modify with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes].

   > Changing the drive letter of a volume may cause programs to no longer run. Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive.

   Master Control Menu is automatically appeared on the screen.
3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.
4. Continue your work for system update as the following message.
5. Click on [OK] to restart the system.
6. Remove the NEC EXPRESSBUILDER CD-ROM from the DVD-ROM drive immediately after clicking on [OK].

IMPORTANT: If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

PROSet

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhances throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive.
2. The [Windows Explorer] dialog starts.

   * The procedure in the case of the standard start menu

     Click Start menu and click [Windows Explorer].

   * The procedure in the case of the classic start menu

     Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "DXSETUP.EXE" in the following directory.

   DVD-ROM Drive Letter:\WINNT\W2K3AMD\NS4\PROSET\WS3XPX64

   The [Intel® PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Complete" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

IP addresses is not be able to set when the "Internet Protocol (TCP/IP)" check box OFF.

This phenomenon will occur with the certain condition.

Check ON the "Internet Protocol (TCP/IP)" check box and IP address will be able to set.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

   * The procedure in the case of the standard start menu

     1) Click Start menu, click [Control Panel], click [Network Connections], and click [Local Area Connection].

   * The procedure in the case of the classic start menu

     1) Click Start menu, click [Settings] and click [Network Connections].

        The [Network Connections] dialog box appears.

     2) Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

   The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel(R) PROSet] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, point to [Control Panel], [Administrative Tools], and click [Computer Management] and then double click the [(Network Adapter Name)] in the Network Adapter list.

   * The procedure in the case of the classic start menu

     1. Click Start menu, point to [Settings] and click [Control Panel].
     2. Click [administrative tools].
     3. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.

2. Click the [Link] and specify the [Speed and Duplex] value the same as the value specified for HUB.

3. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

> **NOTE:** It is recommend to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setting for Solving Problems" described later in this chapter.

Re-install the Network Driver

The network driver will be installed automatically.

Optional Network Board Driver

If you want to utilize optional Network Board (N8104-112/119/111/86/120/121/122), the network driver will be installed automatically. Therefore, the driver attached to the Network board should not be used.

If you want to utilize optional Network Board (N8104-86/111), install the driver stored in NEC EXPRESSBUILDER CD-ROM.

In case of utilizing (N8104-86/111)

"DVD-ROM Drive Letter:\WINNT\W2K3AMD\NS4\PRO100\WS3XPX64"

In case of utilizing (N8104-N8104-112/119/120/121/122)

"DVD-ROM Drive Letter:\WINNT\W2K3AMD\NS4\PRO1000\WS3XPX64"

If the procedure of installation is not clear, refer to the installation procedure described in the section "Installation of the Optional Network Board Driver".

Installation of the Optional Network Board Driver

1. Start Device Manager.
2. Click [Network adapters] and double-click [(Network Adapter Name)].

   [(Network Adapter Name) Properties] appears.

   NOTE: [(Intel (R) PRO/1000...)] is the name of On-Board adapter. All other names show the Optional Network Board.

3. Click [Driver] tab and click [Update Driver...]. [Hardware Update Wizard] appears.
4. Select the [Install from a list or specific location (Advanced)] radio button and click [Next].
5. Select the [Search for the best driver in these locations] radio button and check off the [Search removable media (floppy, CD-ROM...)] check box.
6. Check the [Include this location in the search] check box and when using [(N8104-86/111)], specify
   [DVD-ROM Drive Letter:\WINNT\W2K3AMD\NS4\PRO100\WS3XPX64].

   Then click [Next].

   When using [(N8104-N8104-112/119/120/121/122)], specify
   [DVD-ROM Drive Letter:\WINNT\W2K3AMD\NS4\PRO1000\WS3XPX64].

   Then click [Next].
7. Click [Finish].

Adapter Fault Tolerance (AFT)/Adaptive Load Balancing (ALB)

Adapter Fault Tolerance (AFT) is a feature that creates a group containing more than one adapter and automatically converts the process of the working adapter to the other adapter in the group when any trouble occurred on that adapter.

Adaptive Load Balancing (ALB) is a feature that creates a group containing more than one adapter and enhance the through put by operating packet transmission from the server by all the adapters.

This feature includes AFT feature.

IMPORTANT:

- AFT/ALB setup must be operated after installing the drivers and restarting the system.
- All the adapters specified as a group of Adapter Teaming must exist on the same LAN. If they are connected to the separate switches, they will not work normally.

If you want to utilize AFT/ALB feature, follow the procedure below to setup.

1. The [Intel (R) PROSet] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, point to [Control Panel], [administrative tools], and click [Computer Management] and then double click the [(Network Adapter Name)] in the Network Adapter list.

   * The procedure in the case of the classic start menu

     1. Click Start menu, point to [Settings] and click [Control Panel].
     2. Click [administrative tools].
     3. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.

2. Select [Teaming] tab and then check on [Team with other adapters] and click [New Team...].

   The [New Team Wizard] dialog box appears and click [Next]

   *Specify a name for the team if it necessary.

3. Select the adapters to include in team.
4. Select "Adapter Fault Tolerance" or "Adaptive Load Balancing" and click [Next].
5. Click [Finish].
6. The setup will go back to [Intel (R) PROSet for Wired Connections] dialog box, so click [OK].
7. Restart the system.

Graphics Accelerator Driver

The graphics accelerator driver will be automatically installed by Express Setup or system update.

> **NOTE:** Refer to the following <reinstalling> when the graphics accelerator driver is deleted, and reinstalled after OS is installed.

<About the driver of graphics accelerator (N8105-45)>

When graphics accelerator (N8105-45) board is installed or it separates, the deletion of the graphics accelerator driver which has already been installed is necessary.

The procedure is as follows.

1. Click Start menu, point to [Setting] and click [Control Panel].
2. Click [Add/Remove Programs].
3. Select the graphics accelerator driver from the program list and click "Change/Remove".

   To delete a standard graphics accelerator driver, select:
   [Matrox Graphics Software (remove only)]

   To delete a graphics accelerator (N8105-45) driver, select:
   [ATI Display Driver]

   > **NOTE:** Choose the graphics accelerator driver which has already been installed.

4. Follow the message to continue the uninstallation and restart the system.
5. Installing graphics accelerator driver.

   Manually installation:
   Make installation in the way of "Reinstallation of graphics accelerator driver"

   Automatic installation:
   You should execute the system update again referring to "Updating the system".

   End of installation.

<Reinstallation of graphics accelerator driver>

1. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "SETUP.EXE" which is in the following directory.

   To install a standard graphics accelerator driver:

   <DVD-ROM Drive Letter>:\WINNT\W2K3AMD\VIDEO\MATROX\SETUP.EXE.

   To install a graphics accelerator (N8105-45) driver:

   <DVD-ROM Drive Letter>:\WINNT\W2K3AMD\VIDEO\ES1000\SETUP.EXE.

   NOTE: Please choose one of above to be installed.

4. Follow the message to continue the installation.

   If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.

5. Remove the NEC EXPRESSBUILDER CD-ROM from the DVD-ROM drive, and restart the system.

   End of installation.

SCSI Controller Driver (N8103-75)

If you utilize SCSI controller driver (N8103-75), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

SCSI Controller Driver (N8103-95/8190-126)

The SCSI controller driver will be installed automatically.

Disk Array Controller Driver (N8103-80F/81F)

To additionally install the N8103-80F/81F in a system containing Windows Server 2003 x64 Edition, connect the controller and take the following steps to install the driver:

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click [LSI Logic Megaraid SCSI 320-1/2] which Device Manager lists.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 x64 Edition OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
7. Copying of the driver is completed, and the [Completing the Hardware Update Wizard] dialog box below appears. Click [Finish].

SETTING FOR COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

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Appendix E

Installing Windows Server 2003

This section explains how to install the Windows Server 2003.

NOTICE

Read the following notes or information before installing the Windows Server 2003.

Optional Board Supported by NEC EXPRESSBUILDER

The NEC EXPRESSBUILDER CD-ROM attached to your server supports the following optional boards;

> **NOTE:** If you want to install the other boards by using a driver floppy disk ("OEM-FD for Mass storage device"), except ones listed below, see "Installing with the OEM-FD for Mass storage device" and "Installing Optional Mass Storage Driver" of "Configuration Diskette Creator" in Chapter 6.

- Controllers supporting installation of OS with Express Setup
  - N8103-91 Disk Array Controller (Internal SAS HDD)*
  - N8103-99 Disk Array Controller (0ch)*
  - LSI Logic Embedded MegaRAID™ (embedded on the mother board)
- Other controllers
  - N8103-80F Disk Array Controller (SCSI 1ch)*
  - N8103-81F Disk Array Controller (SCSI 2ch)*
  - N8103-75 SCSI Controller*
  - N8103-95 SCSI Controller*
  - N8190-126 SCSI Controller*

  * Option.

Application of Service Pack

Windows Server 2003 Service Pack 1 is required for your server. When installing Windows Server 2003 R2, it is not necessary to apply Service Pack 1.

Installing Service Pack

You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

Updating System

If you modified the Windows system, execute "Update Express5800 system" in Master Control Menu.

Re-installing to the Hard Disk which has been upgraded to Dynamic Disk

If you want to leave the existing partition when installing the system on the hard disk upgraded to Dynamic Disk, note the following issue:

- Do not select the partition that OS had been installed as the partition to install the OS newly.
- Select "Use the current File System" for the format of OS partition.

Manual Installation when N8103-80F Keeps Connection

If you keep those controllers connecting during installation process, pop-up messages may appear. This does not affect on system behavior. Click [YES] and continue the installation. Follow the message hereafter.

Mounting MO Device

Do not mount an MO device on your server during the Windows installation.

About Removable Media

Do not set removable media, such as DAT, into the device mounted on your server during the OS installation.

Floppy Disk Drive

The internal floppy disk drive is not included in your system at the standard configuration. Prepare the optional USB floppy disk drive if necessary.

Creating Partition Size

The size for the partition that the system is to be installed can be calculated from the following formula.

Size necessary to install the system	+ Paging File Size + Dump File Size + Application Size
Size necessary to install the system =	3500MB (Windows Server 2003 R2) 3500MB (Windows Server 2003 with Service Pack1) 4400MB (Windows Server 2003 + Service Pack1 CD-ROM)
Paging File Size (Recommended)	= Mounted Memory Size * 1.5
Dump file Size	= Mounted Memory Size + 12MB
Application Size	= Required Size

IMPORTANT:

- The above-mentioned paging file size is recommended for collecting debug information (memory dump). The paging file with initial size large enough to store the dump file in the boot drive is required.
  Correct debug information might not be able to be collected due to virtual memory shortage when the paging file is insufficient, so set an enough size of the paging file with the entire system.
- The maximum paging file size which can be set on one partition is 4095MB. If the above paging file size exceeds 4095MB, specify 4095MB for the paging file size.
- The maximum dump file size for the system with more than 2GB memory mounted is '2048MB + 12MB'.
- If you install any application program or the like, add necessary space to the partition to install these programs.

For example, if the mounted memory size is 512MB, the partition size will be calculated by the above formula as follows:

3500MB + (512MB * 1.5) + (512MB + 12MB) + Application Size
= 4792MB + Application Size

Dividing into the partition of the recommended size into multiple disks as written below will solve problem that it cannot be reserved in one disk.

1. Set the "Size required for installation + Paging file size".
2. See Chapter 5 and set that debugging information (equivalent to the dump file size) is to be written to a separate disk.

   (If the disk does not have enough free space to enable the dump file size to be written, then after installing the system using the "Size required for installation + Paging file size", install an additional new disk.)

INSTALLING WINDOWS SERVER 2003

Preparations for Installation

- NEC EXPRESSBUILDER CD-ROM
- Microsoft Windows Server 2003 Standard Edition (CD-ROM)/ Microsoft Windows Server 2003 Enterprise Edition (CD-ROM), Microsoft Windows Server 2003 R2 Standard Edition (CD-ROM)/ Microsoft Windows Server 2003 R2 Enterprise Edition (CD-ROM)
- Windows Server 2003 Service Pack (CD-ROM)
- User's Guide
- Getting Started
- Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER diskette

Creating "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER"

Before installing, create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER diskette.

> **NOTE:** If you have already "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" for NEC Express5800 Server which you are going to install Windows Server 2003, you do not need to create it again.

You can create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER with the following two procedures.

- Create from the menu which appears when running NEC Express5800 Server with NEC EXPRESSBUILDER.

  If you have only NEC Express5800 Server to create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER, use this procedure.

  If Windows Server 2003 can be operated on NEC Express5800 Server, you can use the other procedure described later.

  Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Turn on your NEC Express5800 Server.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive of the server.
4. Press **Ctrl** + **Alt** + **Delete** to reboot the server .(You may also turn off and then on again to reboot the server.)

   The system will boot from the CD-ROM and NEC EXPRESSBUILDER starts.
5. Select [Create Support Disk] from [Tools].

6. Select [Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER] from [Create Support Disk] menu.
7. Insert a floppy disk into the floppy disk drive according to the instruction on the screen.

   Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

■ Create from [Master Control Menu]

[Master Control Menu] runs on the following operating systems.

- Windows Server 2003 x64 Editions
- Windows Server 2003
- Windows XP x64 Edition
- Windows XP
- Windows 2000
- Windows Me/98/95
- Windows NT 4.0

You can create Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER from [Master Control Menu], if you have the computer on which the above operating systems operate.

Follow the steps below.

1. Prepare one 3.5-inch floppy disk.
2. Run the operating system.
3. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive of the server.

   [Master Control Menu] will appear.
4. Click on [Setup] with left mouse button and click [Make OEM-DISK] and then [for Windows Server 2003].

   NOTE: You can do the same operation with the menu appeared by the Right-click.

5. Insert the floppy disk into the floppy disk drive according to the message.

   Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER will be created.

   Write-protect and attach a label, then keep it safely.

Windows Server 2003 Clean Installation

This section explains how to perform a clean installation of Windows Server 2003.

1. Turn on the system power.
2. Insert the Windows Server 2003 CD-ROM into the DVD-ROM drive.
3. Press **Ctrl** + **Alt** + **Delete** to reset the system.

   After a bootable operating system has been installed on the hard disk, press **Enter** while the message "Press any key to boot from CD..." is displayed at the top of the screen.

   If no bootable operating system exists on the hard disk, this step is unnecessary.

   The Windows Server 2003 setup screen will appear.

   If the screen is not displayed, **Enter** was not pressed properly.

   Begin after turning on the system power again.
4. If the RAID controller or SCSI controller is installed in the system, press **F6** in a few seconds when the window is in either of the following states.
   - "Setup is inspecting your computer's hardware configuration ..." is displayed.
   - A screen with a solid blue background is displayed.

   IMPORTANT: There is no visible indication on screen when **F6** has been pressed.
5. When the following message is displayed, press **S**.

   ```
   Setup could not determine the type of one or more mass storage devices
   installed in your system, or you have chosen to manually specify an adapter.
   Currently, Setup will load support for the following mass storage devices.
   ```

   The following message is displayed.

   ```
   Please insert the disk labeled
   manufacturer-supplied hardware support disk
   into Drive A:
   *Press ENTER when ready.
   ```
6. Insert the Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER into the floppy disk drive, and press **Enter**.

   A list of mass storage devices is displayed.
7. Select the [LSI Logic Fusion-MPT SAS Driver (Server 2003 32-bit)] and press **Enter**.

8. Select the proper SCSI Adapter and press **Enter**.

   – [LSI Logic MegaRAID SAS RAID Controller Driver (Server 2003 32-bit)] (When N8103-91 board is installed.)

   – [LSI Logic MegaRAID SAS RAID Controller Driver (Server 2003 32-bit)] (When N8103-99 board is installed.)

   – [LSI MegaRAID Software RAID (Windows XP/2003)] (When LSI Logic Embedded MegaRAIDTM is used.)

   Continue performing tasks according to the subsequent messages that appear.

9. When the following message is shown, press **Enter** to start "Welcome to Setup".

10. When the installation of Windows Server 2003 has finished, the system reboots automatically.

    – Windows Server 2003 has installed: Go on the step 14

    – Windows Server 2003 R2 has installed: Go on the step 11

11. When Windows Server 2003 R2 has been installed, the [Windows Setup] screen will be displayed after logged on to the system.

Windows Setup
Windows Setup is not complete. We recommend that you continue Setup so that you can install the additional components that are available in this version of the Windows Server operating system.
For more information about the new components, see the documentation on Windows Server CD 2.
To continue Setup, insert Windows Server CD 2, or specify the location where the Windows Server CD 2 files are stored, and then click OK.
Location of Windows Server CD 2 files:
D:\
Browse...
OK
Cancel

IMPORTANT:

- In this case, the [Windows Setup] screen may not be displayed. Be sure to install Microsoft Windows Server 2003 R2 DISC 2 according to the following procedures.
- You can install Microsoft Windows Server 2003 R2 DISC 2 after the application of "System update". Be sure to install Microsoft Windows Server 2003 R2 DISC 2. In this case, note that the [Windows Setup] screen is not displayed.

12. Insert Microsoft Windows Server 2003 R2 DISC 2 CD-ROM into the DVD-ROM drive.

    Confirm the parameters and click [OK].

13. When the installation has completed, remove Microsoft Windows Server 2003 R2 DISC 2 CD-ROM from the DVD-ROM drive, and restart the system.

14. When the installation has completed, be sure to execute the tasks described in "Driver Installation and Advanced Settings" and "Updating the System" of manual.

Reinstallation to Multiple Logical Drives

This subsection describes the procedure for reinstalling the operation system if the multiple logical drives exist.

Before Re-installing the Operation System

Be sure to make backup copies before re-installing the operation system just in case.

Re-installing the Operation System

1. Start the clean installation following the procedure described in this manual.
2. Specify the partition in which you want to install the operating system when the following message appears:

   ```
   The following list shows the existing partitions and
   unpartitioned space on this computer.

   Use the UP and DOWN ARROW keys to select an item in the list.
   ```

   * Cannot modify the drive letter of your system or boot volume. Confirm the proper drive letter is assigned and then, continue the setup.

3. Continue the clean installation again following the procedure described earlier in this chapter.

   The drive letter of the re-installed system may differ from the one of the previous system. If you need to modify the drive letter, modify it according to the "Procedure for Modifying the Drive Letter".

Procedure for Modifying the Drive Letter

Be careful that the drive letter of the system or boot volume cannot modify with the following procedure.

1. Click Start menu, right-click [My Computer], and specify [Manage] to start [Computer Management].
2. Specify the [Disk Management] in the left side of the window.
3. Right-click the volume you want to modify the drive letter and specify the [Change Drive Letter and Path...].
4. Click [Yes].
5. Choose the [Assign a drive letter] and specify the drive letter you want to assign.
6. Click [OK].
7. If the following message appears, click [Yes].

   > Changing the drive letter of a volume may cause programs to no longer run. Are you sure you want to change this drive letter?

8. Close the [Computer Management].

Updating the System

To ensure normal system operation you should update your system using the following procedures.

1. Logon to the system using the administrator account or other account which is a member of the Administrators group.
2. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive.

   Master Control Menu is automatically appeared on the screen.
3. Click on [Setup] with left mouse button and click on [Update NEC Express5800 system] section.
4. Continue your work for system update as the following message.
5. Click on [OK] to restart the system.
6. Remove the NEC EXPRESSBUILDER CD-ROM from the DVD-ROM drive immediately after clicking on [OK].

IMPORTANT: If you change the configuration of the system (by adding or removing hardware or Operating system software components) or repair the system, you must run the system update again.

DRIVER INSTALLATION AND ADVANCED SETTINGS

This section describes on how to install and setup various standard drivers mounted on the device.

For the information on installing and setting up the driver that is not described in this section, please refer to the document attached to the driver.

PROSet

PROSet is a utility that confirms the function of network contained in network driver.

Utilizing PROSet enables the following items:

- Confirm detailed information of the adapter.
- Diagnose loop back test, packet transmission test and so on.
- Setup of teaming.

Configuring several network adapters as one team provides the server a tolerant environment on any trouble and enhance throughput between the switches.

PROSet is necessary to utilize these features.

Follow the procedure below to install PROSet.

1. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive.
2. The [Windows Explorer] dialog starts.

   * The procedure in the case of the standard start menu

     Click Start menu and click [Windows Explorer].

   * The procedure in the case of the classic start menu

     Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "DXSETUP.EXE" in the following directory.

   <DVD-ROM Drive Letter>:\WINNT\DOTNET\NS4\PROSET\2KXPWS03

   The [Intel® PROSet - InstallShield Wizard] dialog starts.
4. Click [Next].
5. Choose "I accept the terms in the license agreement" and click [Next].
6. Choose "Complete" and click [Next].
7. Click [Install].
8. When [InstallShield Wizard Completed] window is displayed, click [Finish].
9. Restart the system.

Network Driver

Specify the details of network driver.

One standard network driver that is mounted will be installed automatically, but the link speed and Duplex mode need to be specified manually.

[When PROSet is not installed]

1. The [Local Area Connection Properties] dialog box appears.

   * The procedure in the case of the standard start menu

     1. Click Start menu, Click [Control Panel], Click [Network Connections], and Click [Local Area Connection].

   * The procedure in the case of the classic start menu

     1. Click Start menu, Click [Settings] and Click [Network Connections].

        The [Network Connections] dialog box appears.

     2. Right-click [Local Area Connection] and click [Properties] from pop-up menu.

2. Click [Configure].

   The property dialog box for network adapter appears.

3. Click the [Advanced] and specify the [Link Speed & Duplex] value the same as the value specified for HUB.

4. Click [OK] on the property dialog box for network adapter.

[When PROSet is installed]

1. The [Intel(R) PROSet] dialog box appears.

   * The procedure in the case of the standard start menu

     Click Start menu, point to [Control Panel], [Administrative Tools], and click [Computer Management] and then double click the [(Network Adapter Name)] in the Network Adapter list.

   * The procedure in the case of the classic start menu

     1. Click Start menu, point to [Settings] and click [Control Panel].
     2. Click [administrative tools].
     3. Click [Computer Management] and double click the [(Network Adapter Name)] in the Network Adapter list.

2. Click the [Link] and specify the [Speed and Duplex] value the same as the value specified for HUB.

3. Click [Apply] and click [OK].

Also, add or delete any protocols and services if necessary.

You can operate the process on the property dialog box for local area network which can be appeared from [Network and Dial-up Connection].

> **NOTE:** We recommend you to add [Network Monitor] at [Adding Services]. [Network Monitor] can monitor the frame (or the packet) that the computer installing [Network Monitor] sends or receives. This tool is valuable when analyzing network trouble. For information on how to install the tool, see the "Setup for Trouble Process" later in this document.

Re-install the Network Driver

The network driver will be installed automatically.

See Chapter 5, "Optional Network Board Driver" for re-install the optional network board driver.

Graphics Accelerator Driver

The graphics accelerator driver will be automatically installed by Express Setup or system update.

> **NOTE:** Refer to the following < reinstalling > when the graphics accelerator driver is deleted, and reinstalled after OS is installed.

<About the driver of graphics accelerator (N8105-45)>

When graphics accelerator (N8105-45) board is installed or it separates, the deletion of the graphics accelerator driver which has already been installed is necessary.

The procedure is as follows.

1. Click Start menu, point to [Setting] and click [Control Panel].
2. Click [Add/Remove Programs].
3. Select the graphics accelerator driver from the program list and click "Change/Remove".

   To delete a standard graphics accelerator driver, select:
   [Matrox Graphics Software (remove only)]

   To delete a graphics accelerator (N8105-45) driver, select:
   [ATI Display Driver]

   > **NOTE:** Choose the graphics accelerator driver which has already been installed.

4. Follow the message to continue the uninstallation and restart the system.
5. Installing graphics accelerator driver.

   Manually installation:
   Make installation in the way of "Reinstallation of graphics accelerator driver"

   Automatic installation:
   You should execute the system update again referring to "Updating the system".

   End of installation.

<Reinstallation of graphics accelerator driver>

1. Insert the NEC EXPRESSBUILDER CD-ROM into the DVD-ROM drive.
2. Click Start menu, point to [Programs], [Accessories] and click [Windows Explorer].
3. Run "SETUP.EXE" which is in the following directory.

   To install a standard graphics accelerator driver:
   <DVD-ROM Drive Letter>:\WINNT\DOTNET\VIDEO\MATROX\SETUP.EXE.

   To install a graphics accelerator (N8105-45) driver:
   <DVD-ROM Drive Letter>:\WINNT\DOTNET\VIDEO\ES1000\SETUP.EXE.

   NOTE: Please choose one of above to be installed.

4. Follow the message to continue the installation.

   If the dialog message "Digital Signature could not been found." appears, select [Yes] to continue.

5. Remove the NEC EXPRESSBUILDER CD-ROM from the DVD-ROM drive, and restart the system.

   End of installation.

SCSI Controller Driver (N8103-75/95/N8190-126)

If you utilize SCSI controller driver (N8103-75/95/N8190-126), update your system with NEC EXPRESSBUILDER CD-ROM attached to your system.

The SCSI controller driver will be installed automatically.

Disk Array Controller Driver (N8103-80F/81F)

To additionally install the N8103-80F/81F in a system containing Windows Server 2003, connect the controller and take the following steps to install the driver:

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click [LSI Logic Megaraid SCSI 320-1/2] which Device Manager lists.
3. Click the [Driver] tab and click [Update Driver...].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select the "Search for the best driver in these locations." and check the "Search removable media [floppy, CD-ROM...]" check box.
6. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, and click [Next].
7. Copying of the driver is completed, and the [Completing the Hardware Update Wizard] dialog box below appears. Click [Finish].

Notes on Using the N8103-75 Controller Board

After installing OS, the driver does not installed according to the method of installing OS occasionally.

In that case, please install the driver by the following procedures.

1. Start [Device Manager] from [Start] menu → [Control Panel] → [Administrative Tools] → [Computer Management].
2. Double-click the SCSI Controller driver which Device Manager lists as Other device.
3. Click [Update Driver].
4. When the "Update Device Driver Wizard" appears, select "Install from a list or specific location [Advanced]" and click [Next].
5. Select "Don't search. I will choose the driver to install" and click [Next].
6. Click [Have Disk..].
7. Insert "Windows Server 2003 OEM-DISK for NEC EXPRESSBUILDER" into the floppy disk drive, enter "a:\" into "copy manufacturer's file from:" and click [OK].
8. Specify the following driver and click [Next].
   - [INITIO INI-A10XU2W PCI SCSI Controller] (When N8103-65F board is installed.)
   - [Adaptec SCSI Card 29320ALP -Ultra320 SCSI] (When N8103-75 board is installed.)

The installation of the driver is completed.

Restart the system according to the message appeared on the screen.

About Windows Activation

Windows Server 2003 must be activated before you can use Windows Server 2003.

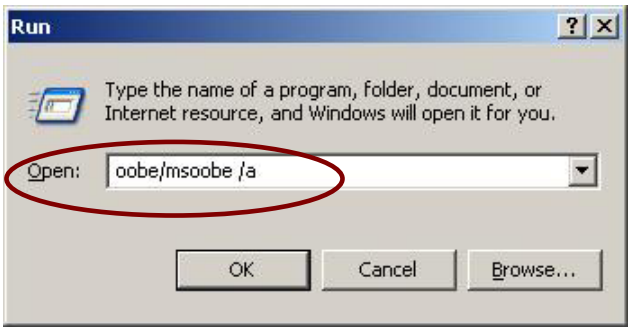
Windows activation process is as follows.

> **NOTE:** When you use Windows Server 2003 R2, activation process is not needed.

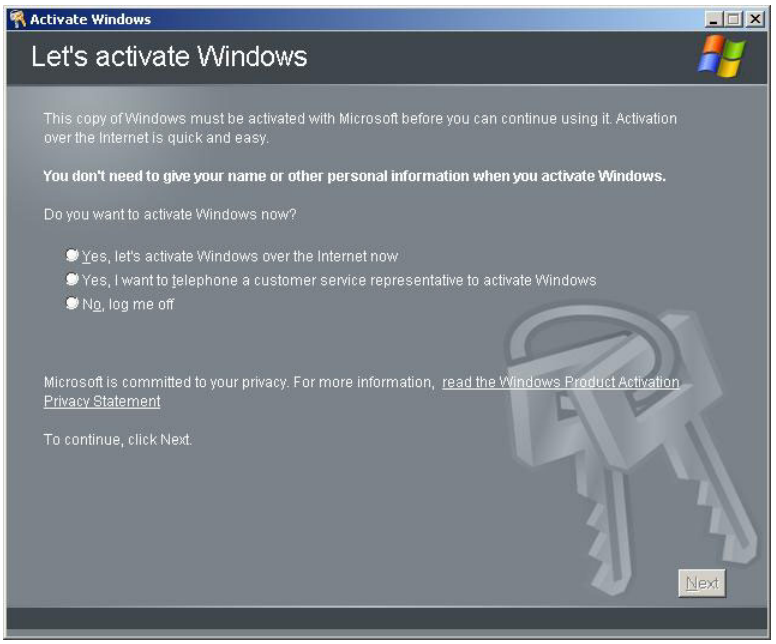
1. Click [Run] on [Start] menu.

   Type as follows in the [Open:] box, and click [OK].

   oobe/msoobe /a



2. When the screen as follows is displayed, click [Next].


Activate Windows
Let's activate Windows
This copy of Windows must be activated with Microsoft before you can continue using it. Activation over the Internet is quick and easy.
You don't need to give your name or other personal information when you activate Windows.
Do you want to activate Windows now?
Yes, let's activate Windows over the Internet now
Yes, I want to telephone a customer service representative to activate Windows
No, log me off
Microsoft is committed to your privacy. For more information, read the Windows Product Activation Privacy Statement
To continue, click Next.
Next

The following screen is displayed.

3. Process "Windows activation" according to the following message.

Available Switch Options for Windows Server 2003 Boot.ini File

Many different switches will be available if you edit Boot.ini file.

For the available switch options, refer to the following information:

- Microsoft Knowledge Base - Article ID: 833721

  "Available switch options for the Windows XP and the Windows Server 2003 Boot.ini files"

If your system has a memory capacity in excess of 4GB in its installing, adding /PAE switch in Boot.ini file will enable the system to be installed with over 4GB of memory.

However, the Microsoft operating system products which support /PAE switch option are limited.

Refer to the following article in Microsoft Knowledge Base to check the supported products.

- Microsoft Knowledge Base - Article ID: 291988

  "A description of the 4GB RAM tuning feature and the Physical Address Extension switch"

Below is the example on how to add /PAE switch to Boot.ini file.

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
3. Click the [Advanced] tab, and then click [Settings] under [Setup and Recovery].
4. Under [System Setup], click [Edit] to open [Boot.ini].
5. Add "/PAE" to [Operating Systems] section in [Boot.ini] file, and then save it.

   <Example of Boot.ini file>

   ```
   [boot loader]
   timeout=30
   default=multi(0)disk(0)rdisk(0)partition(2)\WINDOWS
   [operating systems]
   multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003" /fastdetect
   multi(0)disk(0)rdisk(0)partition(2)\WINDOWS="Windows Server 2003, PAE" /fastdetect
   /PAE
   C:\CMDCONS\BOOTSECT.DAT="Microsoft Windows Recovery Console" /cmdcons
   ```

   This is the end of editing Boot.ini file.

NOTE: If you choose one of the items in the "Default operating system" drop-down list box in [Setup and Recovery] group box, you can make your system start automatically from the switch you specified.

SETTING FOR COLLECTING MEMORY DUMP (DEBUG INFORMATION)

Set for collecting memory dump using the procedure described in Chapter 5.

Appendix F

Product Configuration Record Table

Use this table for information about setup and system environment change.

Hardware

Main Unit						
	Model name		Serial No.		Date Installed	
CPU						
#1	Clock		Serial No.		Date Installed	
#2	Clock		Serial No.		Date Installed	
Memory						
#11, #21	Size		Serial No.		Date Installed	
#31, #41	Size		Serial No.		Date Installed	
#12, #22	Size		Serial No.		Date Installed	
#32, #42	Size		Serial No.		Date Installed	
#13, #23	Size		Serial No.		Date Installed	
#33, #43	Size		Serial No.		Date Installed	
Monitor						
	Type		Model name		Serial No.	
					Date Installed	
Hard Disk Drive						
SAS Port 0	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
SAS Port 1	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
SAS Port 2	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
SAS Port 3	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
SAS Port 4	Type			Serial No.		
	Capacity			Date Installed		
	Type number					
SAS Port 5	Type			Serial No.		
	Capacity			Date Installed		
	Type number					

Backup Device						
Slot 1	Size		Capacity		Serial No.	
	Model name		Type number		Date Installed	
PCI Slot #1B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #2B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #3B						
	Model name				Serial No.	
					Date Installed	
PCI Slot #1C						
	Model name				Serial No.	
					Date Installed	
PCI Slot #2C						
	Model name				Serial No.	
					Date Installed	
PCI Slot #3C						
	Model name				Serial No.	
					Date Installed	
Printer						
	Model name				Serial No.	
	Manufacturer				Date Installed	
Additional Cabinet for Disk						
	Model name				Serial No.	
					Date Installed	
External Peripheral Device 1						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 2						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 3						
	Model name				Serial No.	
	Manufacturer				Date Installed	
External Peripheral Device 4						
	Model name				Serial No.	
	Manufacturer				Date Installed	

Software

Firmware version				
OS Application of RUR media	 ☐ Apply	Name: Name:		Version: Version:
File system	☐ FAT ☐ Others (	☐ HPFS	☐ NTFS)	
Bundled software installed				
Licensed software installed				
Application running when a failure occurred				

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